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THE UNIVERSITY OF ALBERTA

Taxonomy of *Petriellidium*

by



Valerie M. Mann

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

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IN

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THE UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled Taxonomy of *Petriellidium* submitted by Valerie Mann in partial fulfilment of the requirements for the degree of Master of Science in Mycology.

To my parents with love.

Abstract

Strains representing all species of *Petriellidium* plus representative strains of the Microascaceae and Pithoascaceae and *Thielavia* were examined in culture. Characters based on the ascospores, conidia and vegetative growth were recorded and used as attributes for both intuitive and quantitative "TAXMAP" (Carmichael 1980) comparisons.

Benny and Kimbrough's (1980) reclassification of the families Microascaceae and Pithoascaceae was supported by this study. Part of von Arx's (1973, 1978) classification of the genus *Petriellidium* was found to be unsatisfactory. A new key is proposed for the five species accepted in *Petriellidium*; (*P. africanum*, *P. angustum*, *P. boydii*, *P. desertorum* and *P. fimeti*). *P. ellipsoideum* and *P. fusoides* are reduced to synonyms of *P. boydii* and *P. angustum* respectively. Composite descriptions are given for *P. angustum* and *P. boydii*. These two species were found to have identical *Scedosporium* states, but differed in ascospore size and shape. A discussion of the nomenclature of *P. boydii* is included.

The *P. boydii* strains examined did not reflect the wide variation in ascospore size recorded in the literature, but exhibited the moderate intra- and inter-strain variation one would expect in a single species.

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Table of Contents

Chapter	Page
I. Introduction	1
A. Occurrence and Nature of <i>Petriellidium boydii</i> ...	1
B. History of the Classification of <i>P. boydii</i>	3
C. Nomenclator of <i>P. boydii</i>	6
D. Other species described in <i>Petriellidium</i>	6
E. <i>Petriellidium</i> and its relationship to the Microascaceae	8
F. Descriptions of the genera of the Microascaceae	9
<i>Enterocarpus</i> Locquin-Linard 1977	9
<i>Kernia</i> Nieuwland 1916	9
<i>Lophotrichus</i> Benjamin 1949	9
<i>Microascus</i> Zukal 1885	10
<i>Petriella</i> Curzi 1930	10
<i>Petriellidium</i> Malloch 1970	10
II. Materials and Methods	11
A. Strains	11
B. Media	14
C. Standard Culture Conditions	15
Transfers and inocula	15
Temperature	16
Incubation	16
Descriptions	16
Cleistothecium production	17
Ascospore germination studies	17

Scanning Electron Microscopy	18
Light microscopy and photography	19
D. Pasture soil samples	19
Padhye and Thirumalachar (1968) Method	20
Bell (1976) dilution method	20
E. Wood samples	21
F. Transmission EM studies for viruses	22
G. Quantitative analysis	22
Strains analysed	24
Attributes	24
III. Results and Discussion	28
A. Preliminary and miscellaneous investigations ...	28
Pasture soil and wood survey	28
B. Effects of media, time and temperature on <i>P.</i> <i>boydii</i> ascospore and conidial sizes	29
Plate #1: Immature ascospores	42
C. Effects of growth conditions on morphology and spore production	43
D. Results of ascospore germination studies	44
E. Viral studies	44
Plate #2: Viral Studies by Electron Microscopy .	47
F. Results: Strain descriptions	48
Plate #3: <i>Petriellidium boydii</i> UAMH 0002	50
Plate #4: <i>Petriellidium boydii</i> UAMH 0153	52
Plate #5: <i>Petriellidium boydii</i> UAMH 0800	54
Plate #6: <i>Petriellidium boydii</i> UAMH 1099	56

Plate #7: <i>Petrieiellidium boydii</i> UAMH 1265	.....58
Plate #8: <i>Petrieiellidium boydii</i> UAMH 1865	.....60
Plate #9: <i>Petrieiellidium boydii</i> UAMH 2217	.....62
Plate #10: <i>Petrieiellidium boydii</i> UAMH 2324	.....64
Plate #11: <i>Petrieiellidium boydii</i> UAMH 2507	.....66
Plate #12: <i>Petrieiellidium boydii</i> UAMH 2975	.....68
Plate #13: <i>Petrieiellidium boydii</i> UAMH 3230	.....70
Plate #14: <i>Petrieiellidium boydii</i> UAMH 3239	.....72
Plate #15: <i>Petrieiellidium boydii</i> UAMH 3746	.....74
Plate #16: <i>Petrieiellidium boydii</i> UAMH 3749	.....76
Plate #17: <i>Petrieiellidium boydii</i> UAMH 3750	.....78
Plate #18: <i>Petrieiellidium boydii</i> UAMH 3872	.....80
Plate #19: <i>Petrieiellidium boydii</i> UAMH 3873	.....82
Plate #20: <i>Petrieiellidium boydii</i> UAMH 3904	.....84
Plate #21: <i>Petrieiellidium boydii</i> UAMH 3905	.....86
Plate #22: <i>Petrieiellidium boydii</i> UAMH 3973	.....88
Plate #23: <i>Petrieiellidium boydii</i> UAMH 3981	.....90
Plate #24: <i>Petrieiellidium boydii</i> UAMH 3982	.....92
Plate #25: <i>Petrieiellidium boydii</i> UAMH 3987	.....94
Plate #26: <i>Petrieiellidium boydii</i> UAMH 3990	.....96
Plate #27: <i>Petrieiellidium boydii</i> UAMH 3991	.....98
Plate #28: <i>Petrieiellidium boydii</i> UAMH 3995	.....100
Plate #29: <i>Petrieiellidium boydii</i> UAMH 4218	.....102
Plate #30: <i>Petrieiellidium boydii</i> UAMH 4238	.....104
Plate #31: <i>Petrieiellidium boydii</i> UAMH 4248	.....106
Plate #32: <i>Petrieiellidium boydii</i> UAMH 4301	.....108
Plate #33: <i>Petrieiellidium boydii</i> UAMH 4302	.....110

Plate #34: <i>Petriellidium boydii</i> UAMH 4303	.....112
Plate #35: <i>Petriellidium boydii</i> UAMH 4304	.....114
Plate #36: <i>Petriellidium boydii</i> UAMH 4310	.....116
Plate #37: <i>Petriellidium boydii</i> UAMH 4408	.....118
Plate #38: <i>Petriellidium boydii</i> UAMH 4409	.....120
Plate #39: <i>Petriellidium boydii</i> UAMH 4410	.....122
Plate #40: <i>Petriellidium africanum</i> UAMH 4000	..124
Plate #41: <i>Petriellidium angustum</i> UAMH 3984	...126
Plate #42: <i>Petriellidium angustum</i> UAMH 1101	...128
Plate #43: <i>Petriellidium angustum</i> UAMH 3992	...130
Plate #44: <i>Petriellidium angustum</i> UAMH 3997	...132
Plate #45: <i>Petriellidium desertorum</i> UAMH 3993	.134
Plate #46: <i>Petriellidium fimeti</i> UAMH 4257	.....136
Plate #47: <i>Petriella guttulata</i> UAMH 3996	.....138
Plate #48: <i>Petriella lindforsii</i> UAMH 3999	.....140
Plate #49: <i>Petriella musispora</i> UAMH 3986	.....142
Plate #50: <i>Petriella setifera</i> UAMH 1662	.....144
Plate #51: <i>Petriella sordida</i> UAMH 1410	.....146
Plate #52: <i>Microascus desmosporus</i> UAMH 966	....148
Plate #53: <i>Microascus intermedius</i> UAMH 2469	...150
Plate #54: <i>Microascus longirostris</i> UAMH 408	...152
Plate #55: <i>Microascus manginii</i> UAMH 2642	.....154
Plate #56: <i>Microascus singularis</i> UAMH 2637	....156
Plate #57: <i>Microascus trigonosporus</i> UAMH 655	..158
Plate #58: <i>Kernia nitida</i> UAMH 3060	.....160
Plate #59: <i>Lophotrichus ampullus</i> UAMH 1762	....162
Plate #60: <i>Faurelina elongata</i> UAMH 4232	.....164

Plate #61: <i>Pithoascus langeronii</i> UAMH 4234	....166
Plate #62: <i>Thielavia terricola</i> UAMH 1918	.....168
G. Results of TAXMAP analyses	.....170
IV. Taxonomic conclusions	.....194
A. Genera of the Microascaceae	.....194
B. Species of <i>Petriellidium</i>	.....194
Key to the species of <i>Petriellidium</i>	.....196
C. Nomenclator of <i>P. boydii</i>	.....198
D. Composite description of <i>P. boydii</i> and <i>P.</i> <i>angustum</i>	.....198
V. Bibliography	.....201

List of Tables

Table	Page
1. Reported ascospore sizes for isolates referred to as <i>Petriellidium boydii</i>	3
2. Strains examined	12
3. Attributes used in the quantitative analysis	24
4. Ascospore sizes obtained in this study	40
5. Comparison of all strains on conidial and vegetative attributes. a) Results of analysis with differential weighting	173
6. Comparison of all strains on conidial and vegetative attributes. b) Results of analysis with equal weighting	175
7. Comparison of <i>Petriellidium</i> strains on conidial and vegetative attributes. a) Results of analysis with differential weighting	177
8. Comparison of <i>Petriellidium</i> strains on conidial and vegetative attributes. b) Results of analysis with equal weighting	179
9. Comparison of all strains producing ascospores on ascospore and vegetative attributes. a) Results of analysis with differential weighting	181
10. Comparison of all strains producing ascospores on ascospore and vegetative attributes. b) Results of analysis with equal weighting	183
11. Comparison of <i>Petriellidium</i> producing ascospores on	

ascospore and vegetative attributes. a) Results of analysis with differential weighting	185
12. Comparison of <i>Petriellidium</i> producing ascospores on ascospore and vegetative attributes. b) Results of analysis with equal weighting	187
13. Benny and Kimbrough (1980) Classification of the Microascaceae	195

List of Figures

Figure		Page
1.	Ascospore sizes in ranges of length and width according to von Arx (1973,1978)	7
2.	Conidial measurements from cultures on the four media after 31 days incubation at 25°C	31
3.	Ascospore measurements from cultures on the four media after 31 days incubation at 25°C	32
4.	Conidial measurements after 7 and 14 days incubation on Oat. at 25°C	33
5.	Conidial measurements after 31 days incubation on Oat. at 18°C, 25°C and 30°C	34
6.	Ascospore measurements after 31 days incubation on Oat. at 18°C, 25°C and 30°C	35
7.	Conidial measurements after two months incubation on Oat. at 18°C, 25°C and 30°C	36
8.	Ascospore measurements after two months incubation on Oat. at 18°C, 25°C and 30°C	37
9.	Conidial measurements after 100 days incubation on Oat. at 18°C, 25°C and 30°C	38
10.	Ascospore measurements after 100 days incubation on Oat. 18°C, 25°C and 30°C	39
11.	Taxometric map for comparison of all strains on conidial and vegetative attributes, differential weighting	174
12.	Taxometric map for comparison of all strains on	

conidial and vegetative attributes, equal weighting	176
13. Taxometric map for comparison of <i>Petriellidium</i> strains on conidial and vegetative attributes, differential weighting	178
14. Taxometric map for comparison of <i>Petriellidium</i> strains on conidial and vegetative attributes, equal weighting	180
15. Taxometric map for comparison of all strains producing ascospores on ascospore and vegetative attributes, differential weighting	182
16. Taxometric map for comparison of all strains producing ascospores on ascospore and vegetative attributes, equal weighting	184
17. Taxometric map for comparison of <i>Petriellidium</i> strains producing ascospores on ascospore and vegetative attributes, differential weighting	186
18. Taxometric map for comparison of <i>Petriellidium</i> strains producing ascospores on ascospore and vegetative attributes, equal weighting	188

Abbreviations

BBL	Baltimore Biological Laboratory
°C	degrees centigrade
CBS	Centraalbureau voor Schimmelcultures
Cer.	Cereal agar
cm	centimeter
mins	minutes
ml	milliliter
mm	millimeter
Oat.	Oatmeal agar
PYE	Phytone Yeast Extract agar
Sab.	Sabouraud Dextrose agar
SEM	Scanning Electron Microscopy
UAMH	University of Alberta Mold Herbarium
µm	micrometer

I. Introduction

A. Occurrence and Nature of *Petriellidium boydii*

Petriellidium boydii is a widely distributed fungus that has been studied primarily because of its pathogenicity for man and animals. In man, *P. boydii* causes mycetoma, disseminated infections (Walker et al. 1978), brain abscesses (Winston et al. 1978), otomycosis, parotitis (Rippon and Carmichael 1976), keratomycosis (Bakerspigel 1971), sinusitis (Gluckman et al. 1977), pulmonary infections (Louria et al. 1966, Rippon 1981) and prostatitis (Meyer and Herrod 1961). In animals, *P. boydii* causes mycotic abortion in cattle and mycetoma in dogs and horses (Ainsworth and Austwick 1973).

Rippon (1974) gives a complete description of mycetoma, its pathology and the etiologic agents. Mycetoma usually occurs on a hand or foot, following implantation of the fungus into the tissue via injury. There may be an extended time period before clinical manifestations occur (Shear 1922). The resultant infection consists of localized swollen lesions with draining sinuses and grains. These three characters collectively define "mycetoma". *P. boydii* produces a white grain mycetoma. Rippon defines a grain to be composed of "microcolonies" of fungus.

P. boydii has been recovered numerous times from soil. Ajello (1952) first reported its isolation from Tennessee farm soil. Since then many isolates of *P. boydii* from soil

have been reported worldwide (Rippon 1974). Bell (1976) surveyed Alberta cattle feedlots for the occurrence of *P. boydii* in cattle manure. A number of *P. boydii* strains were recovered. He suggested that the fungus passed through the intestinal tract with the feed and was not a post excretion contaminant. Austwick (1976) isolated *P. boydii* from hay, grass and soil. He assumed it to be a main, high-temperature decomposer of organic matter. *P. boydii* has also been reported from marine environments (Pawar et al. 1965, Kirk 1967).

In culture *P. boydii* produces a "brownish mouse fur grey" colony (Rippon 1974). Clavate hyaline to dilute yellow-brown conidia are produced on annellated conidiogenous cells either diffusely (the *Scedosporium* state of *P. boydii*) or on synnemata (the *Graphium* state of *P. boydii*). The ascogenous state, when produced, consists of brown cleistothecia containing evanescent asci with eight ascospores.

Variation in the ascospore size of clinical isolates, as reported in the literature, was found to be larger than expected (Table 1), ranging from 3.4 x 5-6.5 μm (Ajello 1952) to 3.5-7.5 x 7-10 μm (Negroni and Fischer 1944). This variation leads to the question: is *P. boydii* two or more species, or is this intra-specific variation? The primary objective of this study was to answer this question. In addition, the relationship of *P. boydii* to other described *Petriellidium* species and the relationship of *Petriellidium*

to the other genera of the Microascaceae were reviewed.

Table 1 Reported ascospore sizes for isolates referred to as *Petriellidium boydii*

Strain	Length (um)							Width (um)						
	5	6	7	8	9	10	11	3	4	5	6	7	8	
von Arx(1973)														
Shear(1922)														
Brumpt(1922)														
Emmons(1944)														
Negroni(1944)														
Ajello(1952)														
Creitz(1955)														
Ciferri(1960)														
Mirsa(1966)														
Conant(1971)														
El-Ani(1974)														
Rippon(1974)														
Rippon(1976)														
Winston(1977)														
Hironaga(1980)														

The first author and date of the reference in which the *Petriellidium boydii* ascospore size is cited are included in Table 1.

B. History of the Classification of *P. boydii*

The diffuse conidial state was first described as *Monosporium apiospermum* by Saccardo (1911) based on Tarozzi's isolate from a mycetoma. At this time, Saccardo also suggested the generic name *Scedosporium*, but did not validate it. The generic name *Monosporium* is now regarded as a *nomen illegitimum* because its original species included the types of three earlier generic names, *Montospora*, *Peronospora* and *Streptothrix* (Hughes 1958). Castellani and Chalmers (1919) validated the generic name *Scedosporium* and published the combination *Scedosprium apiospermum*; however, most other investigators did not begin to use this name

until the 1970's.

The synnematos conidial state is now referred to the form-genus *Graphium*. The history of *Graphium* was detailed by Crane and Schoknecht (1973). According to Siebenmann (1889), Harz and Bezold in 1889 described *Verticillium graphii*, isolated a number of times from ear infections, which was probably the *Graphium* state of *P. boydii*. Mason (1941) discussed Vuillemin's transfer of this species to *Glenospora* in 1912. Shear (1922) described the *Graphium* state of his *Allescheria boydii* as *Dendrostilbella boydii*. *Dendrostilbella* is now regarded as having a phialidic form of conidial development whereas the *Graphium* state of *P. boydii* has annellidic conidiogenesis. (Carmichael et al. 1980)

The sexual state of *P. boydii* was first described by Shear (1922) based on Boyd and Crutchfield's clinical isolate from an ankle mycetoma. Shear referred the isolate to Saccardo and Sydow's genus *Allescheria*. He proposed names for the three states of the fungus; *Allescheria boydii* for the ascogenous state, *Cephalosporium boydii* for the diffuse conidial state and *Dendrostilbella boydii* for the synnematos state. He did not realize that the conidial states had been previously described.

The relationship between *Allescheria boydii* and *Scedosporium apiospermum* was not discovered until several years later. Jones and Alden (1931) described a *Monosporium apiospermum* mycetoma isolate and its production of black

sclerotium-like bodies, which they thought were probably perithecia, although they did not see asci.

Emmons (1944) discovered *Allescheria boydii* to be the ascogenous state of *Monosporium apiospermum* when an Alberta mycetoma isolate (Dowding 1935), which for six years in his collection had yielded only the conidial state, began producing ascocarps.

Negrone and Fischer (1944) described a fungus isolated from a knee paramycetoma, naming it *Pseudallescheria shearii*. They claimed it differed from *Allescheria boydii* in ascus shape and conidial morphology. However, MacKinnon (1951) regarded it as *Allescheria boydii*, and the name *Pseudallescheria* never came into common use.

MacKinnon (1951) questioned the relationship of *Allescheria boydii* as the sexual state of *Monosporium apiospermum* claiming that the conidial state of *Allescheria boydii* was not of the *Monosporium* type, but rather a *Cephalosporium*. In 1954 he refuted his observation attributing the discrepancy to a contaminated culture.

Malloch (1970) transferred *Allescheria boydii* to his newly proposed genus *Petriellidium*, because in his opinion its characters did not fit the genus *Allescheria*. Malloch was not aware of Negrone and Fischer's publication of *Pseudallescheria*.

C. Nomenclator of *P. boydii*

Petriellidium boydii (Shear) Malloch 1970

=*Allescheria boydii* Shear 1922

=*Pseudallescheria shearii* Negrone et Fischer 1944

Scedosporium state of *P. boydii*

=*Monosporium apiospermum* Saccardo 1911

=*Scedosporium apiospermum* (Sacc.) Castellani
et Chalmers 1919

=*Cephalosporium boydii* Shear 1922

Ciferri (1960) lists other probable synonyms of *Scedosporium apiospermum*.

Graphium state of *P. boydii*

?=*Verticillium graphi* Harz et Bezold 1889

=*Glenospora graphii* (Harz et Bezold) Vuillemin
1912

=*Dendrostilbella boydii* Shear 1922

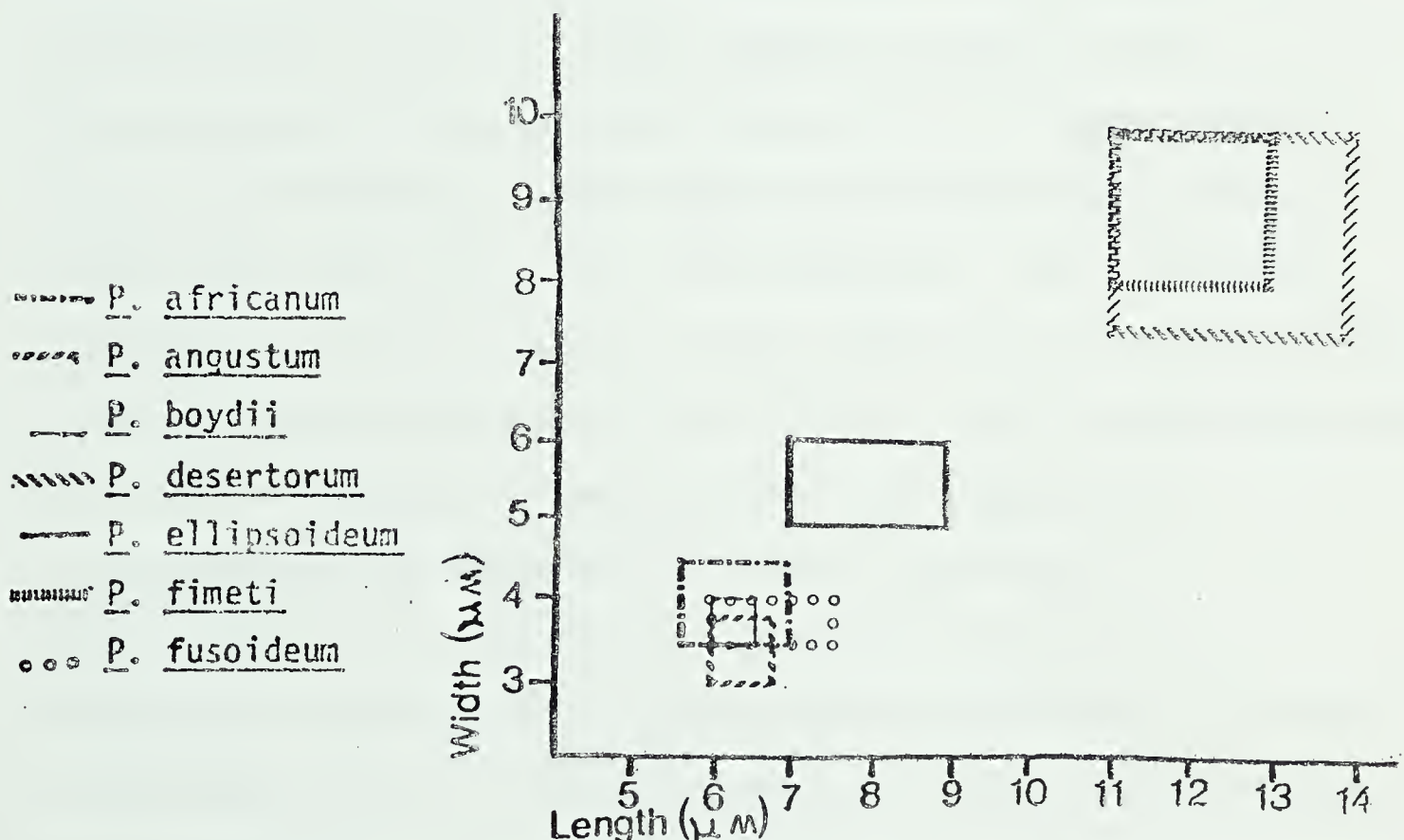
=*Glenospora boydii* (Shear) Poll. et Nannizzi 1929

D. Other species described in *Petriellidium*

Malloch and Cain (1972) added *P. angustum*, isolated from a sewage half digestion tank. Von Arx (1973) revised *Petriellidium* to add four species; *P. africanum*, *P. ellipsoideum*, *P. fusoides* and *P. desertorum*. He also included a key to the genus *Petriellidium*. In 1978, von Arx added a seventh species to the genus, *P. fimeti*. All species

with the exception of *P. boydii* were isolated from soil and dung. Von Arx differentiated the *Petriellidium* species mainly on the basis of ascospore size and shape. As shown in Fig. 1, his ascospore measurements for some of the species overlap. Three clusters are evident; the first consists of four species, *P. africanum*, *P. angustum*, *P. boydii* and *P. fusoides*, the second cluster consists of a single member *P. ellipsoideum* and the third cluster consists of *P. desertorum* and *P. fimeti*. The overlapping of the ascospore sizes raises the question of the validity of some of the species.

Fig. 1 Ascospore size in ranges of length and width according to von Arx (1973, 1978)



The ascospore sizes in ranges of length and width are represented by the boxes.

E. *Petriellidium* and its relationship to the Microascaceae

Luttrell in 1951 proposed the family Microascaceae (class Plectomycetes) to accommodate the genus *Microascus*. *Microascus* was formerly placed in the Ophiostomataceae, but differed in centrum structure. *Petriella* was later included in the Microascaceae by Corlett (1966). Malloch (1970) further revised the family to include *Kernia*, *Lophotrichus* and *Petriellidium* along with *Petriella* and *Microascus*. Von Arx (1973) enlarged the Microascaceae to include *Pithoascus*. Also in 1973, Udagawa and Furuya included *Leuconeurospora* in the Microascaceae. The genus *Faurelina* was included by Locquin-Linard (1975) and in 1977 she also included *Enterocarpus*. Von Arx (1978) updated the key to the Microascaceae and questioned the position of some genera. Benny and Kimbrough (1980) made major revisions to the orders and families of the Plectomycetes. They included a detailed taxonomic history of the orders and families of the Plectomycetes, plus keys to the genera. The Microascales was defined to include three families; Microascaceae, Pithoasaceae and Chadeaudiellaceae. The family Microascaceae was redefined to include six genera; *Petriella*, *Petriellidium*, *Enterocarpus*, *Microascus*, *Kernia* and *Lophotrichus*. *Pithoascus* and *Faurelina* were transferred to a new family, the Pithoascaceae. A new family, the Chadeaudiellaceae with one genus *Chadeaudiella* was proposed.

F. Descriptions of the genera of the Microascaceae

Enterocarpus Locquin-Linard 1977

Type species: *E. unisporus* Locquin-Linard 1977.

Enterocarpus was described as having non-ostiolate, dark brown to black ascocarps with long tufts of hair-like appendages. The reddish ascospores are oval and surrounded by a hyphal capillitium. No conidial state is known.

Kernia Nieuwland 1916

Type species: *K. nitida* (Saccardo) Nieuwland 1916.

Kernia was described by Malloch and Cain (1971) as having thick-walled, non-ostiolate, dark brown to black ascocarps with fascicles of hair-like appendages. The reddish brown to brown ascospores are ellipsoidal to reniform. The conidial state when present is *Scopulariopsis* or *Graphium* or an arthrospore state.

Lophotrichus Benjamin 1949

Type species: *L. ampullus* Benjamin 1949. *Lophotrichus* was described by Malloch (1970) as having ostiolate, dark brown ascocarps with a neck. The golden ascospores are ellipsoidal to slightly asymmetrical. No conidial state is known.

Microascus Zuka1 1885

Type species: *M. longirostris* Zuka1 1885. *Microascus* was described by Barron et al. (1961) as having ostiolate, dark, carbonaceous, perithecium-like ascocarps with necks. The ascospores extrude from the mouth of the neck in a long red-brown cirrhous and occur in a variety of forms; oval, concavo-convex, plano-convex or triangular. The conidial state is *Scopulariopsis*, *Wardomyces* or *Wardomycopsis*, or in one species lacking.

Petriella Curzi 1930

Type species: *P. sordida* (Zuka1) Barron et al. 1961. *Petriella* was described by Barron et al. (1961) as having an ostiolate, black, carbonaceous, perithecium-like, necked ascocarp. The red-brown asymmetrical to ellipsoidal ascospores are extruded in a cirrhous. The conidial states belong to *Sporothrix* and/or *Graphium*.

Petriellidium Malloch 1970

Type: *P. boydii* (Shear) Malloch 1970. *Petriellidium* was described by von Arx (1973) as having non-ostiolate, brown, ascocarps. The ascospores are golden, symmetrical and ellipsoidal. The conidial states belong to *Scedosporium* and/or *Graphium*.

II. Materials and Methods

A. Strains

At the beginning of this study, the University of Alberta Mold Herbarium and Culture Collection (UAMH) contained a number of strains identified as *P. boydii*. Additional isolates of *P. boydii* were obtained from J. Kane, Ontario Ministry of Health and by soil sampling of Edmonton area pastures. Type strains of the other *Petriellidium* species and other members of the Microascaceae were used whenever possible. Details of the source of each strain and its original identification are given as part of the description of the individual strains.

Table 2 lists the strains examined according to their identification at the start of the study. The authors and places of publication of the names are given here for convenience. The strains examined included; 35 isolates previously identified as *P. boydii* (or one of its conidial states); 6 isolates identified as other *Petriellidium* species, and 21 strains representing species of related genera, *Kernia*, *Lophotrichus*, *Microascus* and *Petriella*. Strains of *Pithoascus*, *Faurelina* and *Thielavia*, were also included because of their similarity with the Microascaceae.

Table 2 Strains examined

Microascaceae

Petriellidium

- P. boydii* (Shear) Malloch Mycologia 62:738 1970 38 strains
- P. africanum* v. Arx & Franz Persoonia 7:370 1973 UAMH 4000
- P. angustum* Malloch & Cain Can. J. Bot. 50:66 1972 UAMH
3984
- P. desertorum* v. Arx & Moustafa Persoonia 7:371 1973 UAMH
3993
- P. ellipsoideum* v. Arx & Fassatiova Persoonia 7:370 1973
UAMH 3987
- P. fimeti* v. Arx, Mukerji & Singh Persoonia 10:26 1978 UAMH
4257
- P. fusoides* v. Arx Persoonia 7:371 1973 UAMH 3997

Kernia

- K. nitida* (Sacc) Nieuwland Amer. Mid. Nat 4:379 1916 UAMH
3060

Lophotrichus

- L. ampullus* Benjamin Mycologia 41:347 1949 UAMH 1762

Microascus

- M. desmosporus* (Lechmere) Curzi Boll. Staz. Pet. veg. Roma.
11:60 1931 UAMH 966
- M. intermedius* Emmons and Dodge Mycologia 23:324 1931 UAMH
2469
- M. longirostris* Zukal Verh. zool-bot Ges Wien 35:339

Table 2 (continued)

1885	UAMH 408
<i>M. manginii</i> (Loub.) Curzi Boll. Staz. Pat. veg. Roma. 11:60	
1931	UAMH 2642
<i>M. singularis</i> (Sacc.) Malloch & Cain Can.J.Bot. 49:859 1971	
	UAMH 2637
<i>M. trigonosporus</i> Emmons & Dodge Mycologia 23:317 1931	UAMH
655	

Petriella

<i>P. guttulata</i> Barron & Cain Can. J. Bot. 39:841 1961	UAMH
3996	
<i>P. lindforsii</i> Curzi Boll. Staz. Pat. veg. Roma. 11:380-423	
1931	UAMH 3999
<i>P. musispora</i> Malloch Mycologia 62:728-731 1970	UAMH 3986
<i>P. setifera</i> (Schmidt) Curzi Boll. Regia. Staz. Patol. Veg.	
10:382	UAMH 805 1662 1924 2702
<i>P. sordida</i> (Zukal) Barron & Gilman Can. J. Bot. 39:839 1961	
	UAMH 1410 3983 3985

Pithoascaceae

Faurelina

<i>F. elongata</i> (Udawaga & Furaya) v. Arx Persoonia 10:27-28	
1978	UAMH 4232

Pithoascus

<i>P. langeronii</i> v. Arx Proc. K. Ned. Akad. Wet. (C) 76:295	
1973	UAMH 4234

Table 2 (continued)

Chaetomiaceae

Thielavia

T. terricola (Gilman & Abbot) Emmons Bul. Torry Bot. Club.

57:124 1930

UAMH 1918

B. Media

The following media were employed in this study.

1. Oatmeal agar

Magnesium sulfate	1 g
Potassium dihydrogen phosphate	1.5g
Sodium nitrate	1g
Oatmeal	10g
Agar	18g
Water	1000ml

2. Cereal agar

Pablum Mixed Cereal, (Mead Johnson)	100g
Agar	15g
Water	1000ml

3. Phytone Yeast Extract agar (BBL)

Dextrose	40g
Phytone	10g
Yeast extract	5g
Streptomycin	.03g
Chloramphenicol	.05g
Agar	17g

Water	1000ml
4. Sabauraud's Dextrose agar (Difco)	
Dextrose	40g
Neopeptone	10g
Agar	15g
Water	1000ml
5. Rose Bengal medium	
Czapek Solution agar (Difco)	49g
Rose Bengal dye (Matheson, Coleman and Bell)	.675g
Streptomycin (Allen and Hanbury)	.03g
Water	1000ml

All media were sterilized by autoclaving at 121°C at 15 pounds steam pressure for 15 minutes. Approximately 35 mls of the medium was transferred to a 90 mm plastic petri plate and allowed to cool.

C. Standard Culture Conditions

Transfers and inocula

Working stock cultures on cereal slants were prepared from the frozen or lyophilized UAMH collection and incubated at 25°C for 1 - 2 weeks until most of the agar surface was covered by mycelial mat. The stock cultures were then kept at 4°C.

A small piece of the stock culture mycelial mat was transferred to the center of agar plates for growth. Each strain was inoculated to Oat., Cer., PYE and Sab. agar plates at three separate times for the *Petriellidium* strains

and one to two times for the other genera and incubated at 25°C.

Temperature

Oat. plates of the *Petriellidium* strains contained in the culture collection at the beginning of the study were incubated at 18°C, 25°C and 30°C for 31, 63 and 100 days. Oat. plates for all the *Petriellidium* species, and the remaining genera of the Microascaceae, *Faurelina*, *Pithoascus* and *Thielavia* were incubated at 37°C, 40°C, 45°C and 50°C until the maximum growth temperature had been determined. The plates were sealed with tape to retard drying.

All other plates were incubated at 25°C unless otherwise stated.

Incubation

Cultures were incubated in the inverted position unless otherwise stated. Cultures were examined for one month (31 days) then held for at least two months with daily fluorescent room light for examination for cleistothecial production. If the culture was to be held for an extended period of time e.g. five months it was placed in a plastic bag.

Descriptions

Each colony on Oat., Cer., PYE and Sab. agar was examined every four days for growth characteristics and production of the ascosporic and synnemalous states. After 31 days, mounts were made for microscopic examination.

Cleistothecium production

Several methods were tried to induce non-cleistothecium producing strains of *Petriellidium* to produce cleistothecia.

1. Cultures were incubated over extended time periods, up to five months at 25°C.
2. Cultures were incubated at 18°C and 30°C for 100 days in plastic bags.
3. Cultures were incubated at 25°C for four months, then at 4°C for two months.
4. Cultures were incubated at 25°C for one month then traumatized by slicing the mycelial mat with an inoculating needle and re-incubated for at least one month.
5. Cultures were inoculated on PYE slants, incubated for two weeks, placed in a freezer at -20°C for two weeks, then incubated at 25°C for three months.
6. Crossing experiments with non-cleistothecium producing strains were performed by L. Sigler. The strains examined included UAMH 0800, 3230, 3873, 3904 and 3905. All possible pairs of strains were streaked side by side on Cer. plates and incubated at 25°C for 55 days. The colonies were examined at various times for cleistothecia.

Ascospore germination studies

Mature cleistothecia of *Petriellidium* and *Petriella* species were removed from approximately two month old Oat. plates (Cer., if no cleistothecia were found on the Oat.

plate) and washed in a drop of sterile distilled water in a well slide. A cleistothecium was then transferred to a test tube with 10 drops of sterile water. The cleistothecium was crushed and the suspension mixed thoroughly. Two drops of the suspension were placed on a PYE slide culture and allowed to dry. A coverslip was placed over the modified slide culture. Slide cultures were prepared according to the Mycologist's Handbook (Hawksworth 1974) except that the bent glass rod was replaced with two sterile applicator sticks. Two drops of molten PYE agar were dropped onto the slide and allowed to cool. The sterile filter paper was not moistened unless after five days of incubation at 25°C the ascospores had not germinated. The slide was examined daily for germination of the ascospores. Pictures of germinating ascospores were taken.

Scanning Electron Microscopy

Cultures were examined for the presence of mature cleistothecia (as judged by color and size). Cleistothecia of *Oat.* cultures were mostly submerged within the agar, while those found on other media were within the mycelial mat.

Blocks of agar or mycelial mat approximately 3x3x1 mm containing mature cleistothecia were cut from the sporulating colonies, placed in 1% osmium tetroxide in Sorenson's buffer and left overnight. The blocks were washed three times with Sorenson's buffer then dehydrated in an alcohol series (30%, 50%, 70%, 80%, 90% and 95%) for 30

minutes at each step. After dehydration the agar block was placed on a round coverglass. The cleistothecia were removed from the agar block and crushed open, liberating the ascospores. An intact cleistothecium was also dried on the coverglass. The coverglass with ascospores was allowed to dry overnight. If the specimen could not be examined immediately it was placed in a desiccator. The dried coverglass holding the specimen was glued to an aluminum stub, gold plated by the sputter technique and examined with a Cambridge Stereoscan S150 Scanning Electron Microscope.

Light microscopy and photography

Microscope preparations from colonies or slide cultures were made in glycerine jelly (Ainsworth 1971) mounting medium. The preparations were examined under a Zeiss phase microscope.

Photographs were taken with a 35mm camera with Kodak Panatomic X film. Photographs of colonies after 4 days incubation were taken with the same camera but attached to a stereomicroscope. Photographs of colonies after 21 days incubation were taken with a 35mm camera attached to a copy stand.

D. Pasture soil samples

28 soil samples were taken in the summer of 1980 from the superficial layer of pastures in the Edmonton area. In most cases hay and manure were present in the sample. One sample consisted only of manure and three others contained

chicken litter. Samples were placed in plastic bags and stored at room temperature until processed by two different procedures.

Padhye and Thirumalachar (1968) Method

Approximately one gram of soil was suspended in 30 ml of sterile antibiotic water containing 5000 units/ml sodium penicillin and 1000 units/ml streptomycin sulfate. The mixture was shaken and allowed to stand for one hour, after which one ml of supernatant was pipetted to PYE agar plates, spread with a glass spreader and incubated at 37°C. The majority of saprophytes are inhibited by the high temperature. The plates were incubated in the upright position for the first 24 hours to dry, then inverted. They were examined daily until overgrown with *Rhizopus* species, usually in about 3 days. Separate recognizable colonies were transferred to PYE agar plates at 37°C for subsequent identification.

Bell (1976) dilution method

Approximately one gram of soil was suspended in antibiotic water prepared as in the previous procedure; then serial dilutions were made in distilled water. One ml of the original and the 1:100 and 1:1000 dilutions were spread onto Rose Bengal agar plates and incubated at 37°C in the dark. A control plate was inoculated with *P. boydii* to check that growth conditions were suitable. The plates were examined after 4 days and every two days thereafter until no new colonies were evident.

Mounts of colonies to be identified were made in lactofuchsin. Identifications of the Hyphomycetes to generic level were made with the assistance of "The Genera of Hyphomycetes" (Carmichael et al. 1980) and to the species level using the specified references.

E. Wood samples

37 samples of wood soaked in sea water were collected during the summer of 1980 from the estuary of the Shediak River in N. B., wrapped in foil and placed in plastic bags. The samples were stored at room temperature until processed two weeks later.

Small (approximately 1cm x 5 mm x 1mm) chips were removed with a sterile scalpel and placed in five ml of sterile water, mixed and allowed to stand. A one ml sample was transferred to a Rose Bengal agar plate and spread with a sterile glass spreader. The plates were incubated in plastic bags at 37°C as noted with the soil samples. The plates were examined after four days and every two days thereafter for 14 days. Any colonies found were transferred to a PYE plate for identification. The wood samples were also placed in Petri dishes on top of a moistened filter paper and incubated at 37°C for two months then transferred to 25°C for five months. The wood samples were examined under a stereomicroscope and mounts were prepared in lactofuchsin from any sporulating growth on the wood. Cultures with different salt concentrations were not

attempted.

F. Transmission EM studies for viruses

The *P. boydii* strain UAMH 2324 was atypical and exhibited "poor growth". It did not produce aerial hyphae and at times the transfers failed to grow. Electron microscopic studies were performed in the hope of determining if a viral infection was present.

A block of hyphal mat, approximately 3x3x1 mm was cut from a culture growing on Cer. agar at 25°C. UAMH 2 was used as a control. The mycelial mats were fixed as previously described for SEM. A final rinse of absolute alcohol, followed by two rinses in propylene oxide were included. The samples were embedded in epon and heated to 60°C overnight.

The samples were cut and sectioned by a Richert OMU 2 sectioner, placed on a copper grid, stained with uranyl acetate for 10 mins, rinsed in methanol followed by a water rinse then further stained with lead citrate for 6 mins, rinsed and allowed to dry. A Philips EM 300 transmission electron microscope was used to examine the sections for the presence of viral particles and photographs of the sections were taken.

G. Quantitative analysis

Data obtained from observations on the studied strains were analysed by the "TAXMAP" computer classification program (Carmichael 1980) The program classifies the strains

into clusters of related strains by performing a series of statistical evaluations on the data (attribute values) and provides a taxometric map illustrating the inter-cluster relationships.

The analysis is performed with either differentially or equally weighted attributes. In the differential analysis, the attribute weight is calculated as the base 2 log of the number of classes over the range of the attribute (a class being one confidence interval wide) allowing good attributes to be stressed. In the equally weighted analysis the weight of every attribute is set at one.

The relative difference between pairs of strains or Operational Taxonomic Units (OTU's) is computed for each attribute, then the average difference between the pairs of OTU's for all attributes is determined. Clusters are defined by four criteria; (1) the single linkage criterion ("the single link compared to the average of the preceding single links") (2) the average linkage criterion ("a measure of closeness to all the members of the cluster") (3) the ratio criterion ("the minimum similarity between any pair of points in the cluster divided by the minimum similarity between the point being considered for admission and any point in the cluster") and (4) exclusion of points contained within another cluster (Carmichael et al. 1968).

Strains analysed

All strains listed in Table 2 were included in the quantitative analysis and two additional strains; a

Microascus desmosporus and *Thielavia basicola* UAMH 4305.

Attributes

The attributes used in the quantitative analysis are listed in Table 3.

Table 3 Attributes used in the quantitative analysis

KEY TO ATTRIBUTE TYPES - BY WEIGHTING PROCEDURE			
0	=	DELETE, WEIGHT = 0.	
1	=	SET WEIGHT TO 1.0.	
2	=	WEIGHT AS LOG2 OF NO. OF CONFIDENCE INTERVAL CLASSES IN RANGE.	
3-N	=	MATCH WEIGHT = LOG2 N, NO-MATCH WEIGHT = 1.0.	
ATTRIBUTE NO	TYPE	NAME AND STATES (0/1/2/ETC)	95% CONFIDENCE INTERVAL
1	2	ASCOMATA DIA. MICRONS MIN.	68.28
2	2	ASCOMATA DIA. MICRONS MAX.	68.28
3	2	ASCOSPORE LENGTH MICRONS MIN.	2.12
4	2	ASCOSPORE LENGTH MICRONS MAX.	2.12
5	2	ASCOSPORE WIDTH MICRONS MIN.	1.60
6	2	ASCOSPORE WIDTH MICRONS MAX.	1.60
7	2	DIFFUSE CONIDIA LENGTH MICRONS MIN.	3.28
8	2	DIFFUSE CONIDIA LENGTH MICRONS MAX.	3.28
9	2	DIFFUSE CONIDIA WIDTH MICRONS MIN.	2.20
10	2	DIFFUSE CONIDIA WIDTH MICRONS MAX.	2.20
11	2	GRAPH. CONIDIA LENGTH MICRONS MIN.	3.76
12	2	GRAPH. CONIDIA LENGTH MICRONS MAX.	3.76
13	2	GRAPH. CONIDIA WIDTH MICRONS MIN.	1.52
14	2	GRAPH. CONIDIA WIDTH MICRONS MAX.	1.62
15	2	CHLAMYDO LENGTH MICRON MIN	4.56
16	2	CHLAMYDO LENGTH MICRON MAX	4.56
17	2	CHLAMYDO WIDTH MICRON MIN	4.28
18	2	CHLAMYDO WIDTH MICRON MAX	4.28
19	2	COLONY COLOR	4.00
20	3	REVERSE COLOR(LIGHT 1 MOD DARK 2 DARK 3)	1.00
21	2	ORANGE PIGMENT PRESENT/ABSENT	1.00
22	2	GROWTH AFTER 28 DAYS ON OATMEAL AGAR	4.00
23	2	TYPE OF GROWTH (0-NOT FURRY 1-FURRY)	1.00
24	2	CLEIST. OSTIOLE PRESENT/ABSENT	1.00
25	2	CLEIST. HAIR PRESENT/ABSENT	1.00
26	2	CLEIST. PRESENT/ABSENT	1.00
27	6	ASCOSPORE (ELLIP 1 HEART 2 ALLA 3 TRI 4 OTH 5 ABSENT 0)	1.00
28	5	DIFFUSE CONIDIA STATE (SCED 1 SPORD 2 SCOP 3 ARTH 4 ABSENT 0)	1.00
29	2	GRAPH. CONIDIA PRESENT/ABSENT	1.00
30	2	BROWN CHLAMYDO PRESENT/ABSENT	1.00
31	2	MAX GROWTH TEMP (BELOW 37 -1 37 -2 40 -3 45 -4 ABOVE 45 -5)	1.00
32	2	CLEIST. DIA. MICRONS AVERAGE	68.28
33	2	ASCOSPORE LENGTH MICRONS AVERAGE	2.12
34	2	ASCOSPORE WIDTH MICRONS AVERAGE	1.60
35	2	DIFFUSE CONIDIA LENGTH MICRONS AVERAGE	3.28
36	2	DIFFUSE CONIDIA WIDTH MICRONS AVERAGE	2.20
37	2	GRAPH. CONIDIA LENGTH MICRONS AVERAGE	3.76
38	2	GRAPH. CONIDIA WIDTH MICRONS AVERAGE	1.52
39	2	CHLAMYDO LENGTH MICRON AVERAGE	4.56
40	2	CHLAMYDO WIDTH MICRON AVERAGE	4.28

Measurements of the ascospores and conidia were made from camera lucida drawings of 25 conidia or ascospores from slides from the standard media set or slide cultures and slides contained within the UAMH slide collection. Ten ascomata were measured with an ocular scale. The mean and standard deviation were calculated for each data set. The maximum, minimum and average of the measurements were used as attribute values.

The ascomata were scored as 1-present, 0-absent. The presence or absence of an ostiole and external hair were also scored.

Ascospore shape was coded by six non-ordered classes; 1-ellipsoidal, 2-heart shaped, 3-allantoid, 4-triangular, 5-other, and 6-absent.

The diffuse conidial state was coded by five non-ordered states describing the type of conidium development; 1-*Scedosporium*, 2-*Sporothrix*, 3-*Scopulariopsis*, 4-Arthroconidia and 5-absent. The presence or absence of the *Graphium* conidial state and brown chlamydospores were coded as 1-present, 0-absent.

The type of hyphal mat was coded as being furry that is similar to rabbit's fur, - 1 or not - 0.

The maximum growth temperature on Oat. after 21 days incubation was coded as five ordered classes; 1-below 37°C, 2-37°C, 3-40°C, 4-45°C, and 5-above 45°C.

The vegetative colony color on Oat. after 28 days incubation at 25°C was coded as 18 ordered classes ranging

from clear to deep olive green. Empty classes were left between colours that were especially distinct. The colours were not based on a colour code standard such as Ridgway 1912 (Hawksworth 1974) because the descriptions become meaningless if the code is not available.

Clear	1
Off white	3
Light camel	4
Light mouse brown	5
Moderate mouse brown	6
Moderate mouse brown grey	7
Dark mouse brown	8
Light grey	10
Moderate silver grey	11
Dark grey	12
Light grey green	14
Deep grey green	15
Moderate olive green	17
Dark olive green	18

Reverse color on Oat. agar after 28 days incubation at 25°C was coded as three ordered classes; 1-light, 2-moderately dark or with dark patches or 3-dark.

The colony size on Oat. after 28 days incubation at 25°C was coded as the diameter in mm, or 90 mm if filling the petri plate.

Characters in which the variation within the strain was as large as the variation between the strains were not used, i.e., ascus size and shape.

When data were unavailable a value of 999 was assigned and assessed as missing data by the TAXMAP program.

III. Results and Discussion

A. Preliminary and miscellaneous investigations

Pasture soil and wood survey

The pasture soil survey of 28 samples from pasture areas around Edmonton, Alberta yielded the following fungi;

Species present	No.of samples
<i>Rhizopus</i> species.....	23
<i>Phoma</i> species.....	1
<i>Aspergillus fumigatus</i>	22
<i>Aspergillus nidulans</i>	1
<i>Aspergillus niger</i>	1
<i>Aspergillus ustus</i>	3
<i>Scopulariopsis brevicaulis</i>	8
<i>Scopulariopsis konigii</i>	3
<i>Chrysosporium luteum</i>	2
<i>Chrysosporium parvum</i>	1
<i>Fusarium oxysporum</i>	1
<i>Penicillium</i> species.....	1
<i>Thielavia basicola</i>	1
<i>Petriellidium boydii</i>	2

Of the three *P. boydii* strains isolated, UAMH 4408 produced the *Petriellidium* and *Graphium* states, the other two strains UAMH 4409 and UAMH 4410 both produced only the *Graphium* and *Scedosporium* states. Because the soil samples contained bits of hay and manure, it is not certain, whether the *P. boydii* isolates came from these substances or from

the other soil components.

An interesting isolate from the soil survey proved to be *Thielavia basicola* UAMH 4305. *Thielavia* produces ascospores similiar in size and shape to *Petrieiellidium*, but differs in ascospore colour, conidial state and hyphal mat. Malloch and Cain (1973) previously reported the isolation of *Thielavia basicola* from soil.

The survey of 28 wood samples from estuary of the Shediac River, N. B. yielded the following results;

Species present	No. of samples
<i>Aspergillus fumigatus</i>. . . . .	.4
<i>Chrysosporium tropicum</i> . . . . .	.1
<i>Culcitalna achraspora</i>	16
<i>Microascus desmosporus</i> . . . . .	.1

The wood survey did not yield *Petrieiellidium boydii*. Kirk (1967) isolated *P. boydii* from wood baits in an estuary in North Carolina. Pawar et al. (1965) isolated the *Scedosporium* state of *P. boydii* from saline mangrove flats. A member of the Microascaceae was isolated, *Microascus desmosporus*.

B. Effects of media, time and temperature on *P. boydii* ascospore and conidial sizes

Comparisons of ascospores and conidia using a representative sample of five *P. boydii* strains (UAMH 0002, 0153, 1265, 1865, and 2217) producing both the ascogenous state and diffuse conidial state were made to determine if

medium, time or temperature affected ascospore or conidial size. The conditions tested were:

1. Four media; Oat., Cer., PYE and Sab. after 31 days incubation at 25°C.
2. Oat. agar after seven and 14 days incubation at 25°C.
3. Oat. agar after 31 days incubation at 18, 25 and 30°C.
4. Oat. agar after 63 days incubation at 18, 25 and 30°C.
5. Oat. agar after 100 days incubation at 18, 25 and 30°C.

The results are shown in Figs. 2-10. The ascospore and conidium measurements, two standard deviations and the mean are represented by a line. The blank space in its middle represents the mean. The dots at either end of the line represent two standard deviations from the mean. Since no consistent differences were evident, it was concluded that comparisons of ascospores and conidia could be made with slides made from cultures grown for different times, or at different temperatures or on different media, within the limits of the test conditions.

The rate of ascospore maturation varied with the medium used. A mature ascospore was defined to be golden in brightfield microscopy. Plate 1 shows immature ascospores (UAMH 2217) contained within asci after one month incubation on PYE agar at 25°C. A mature ascospore is shown for comparison in the lower right photograph. There is considerable size variation among the immature ascospores,

Fig. 2 Conidial measurements from cultures on the four media after 31 days incubation at 25°C.

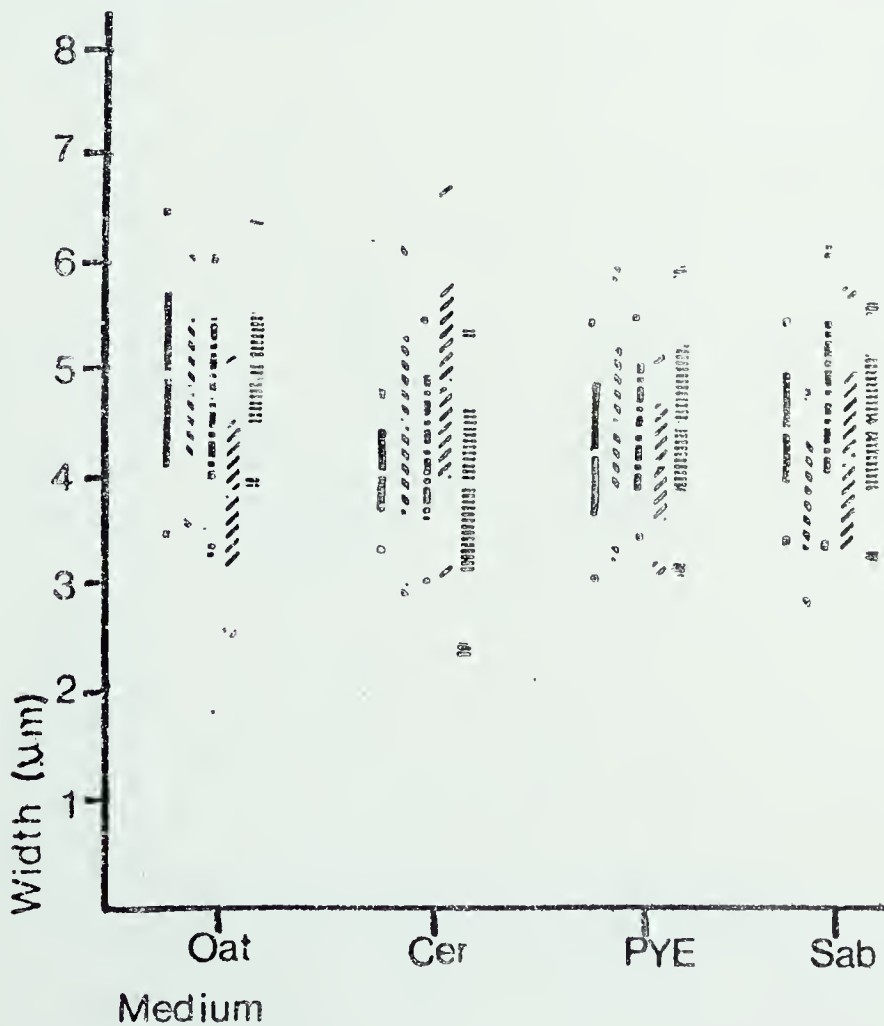
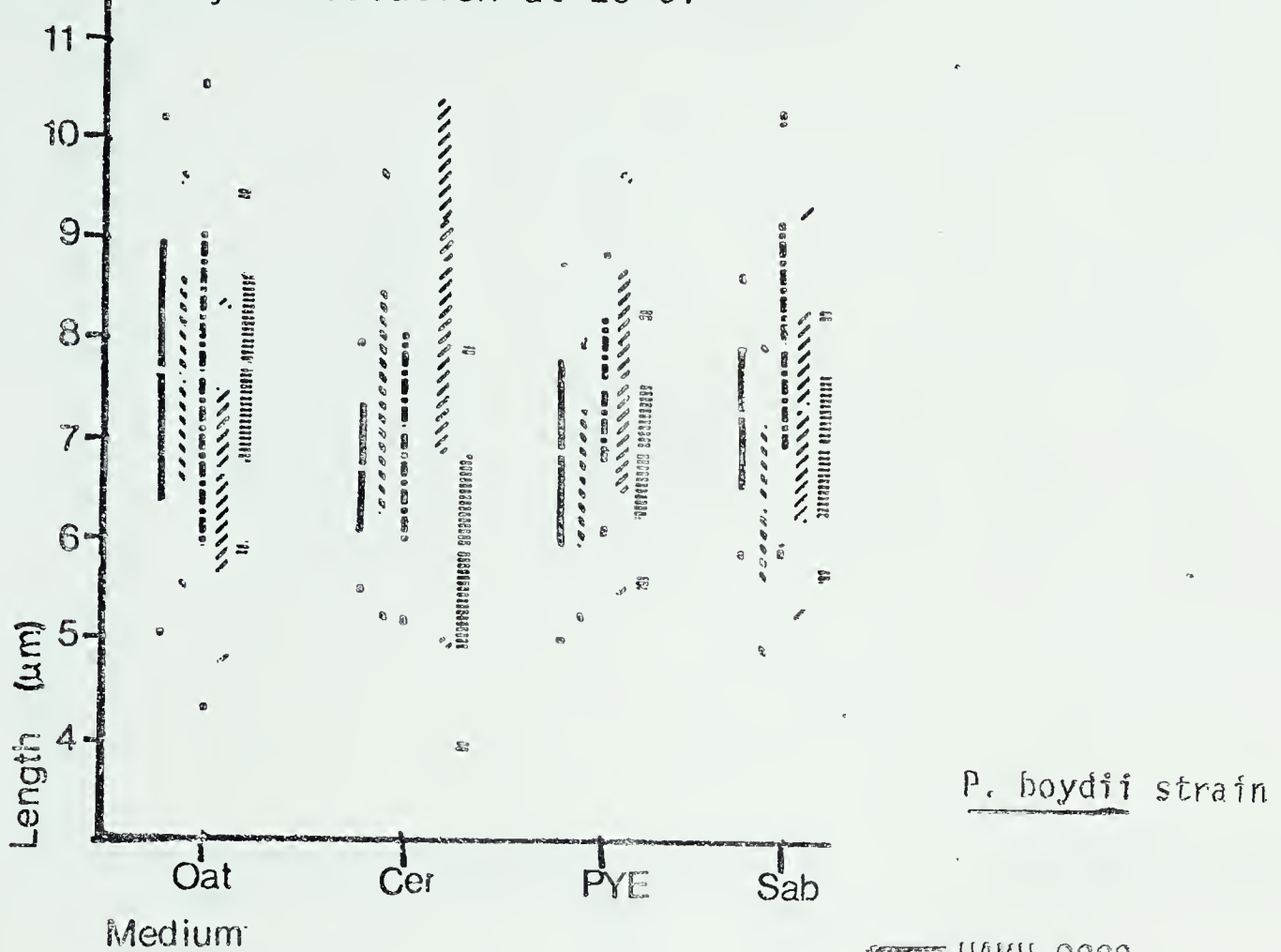


Fig. 4 Conidial measurements after 7 and 14 days incubation on Oat. at 25°C.

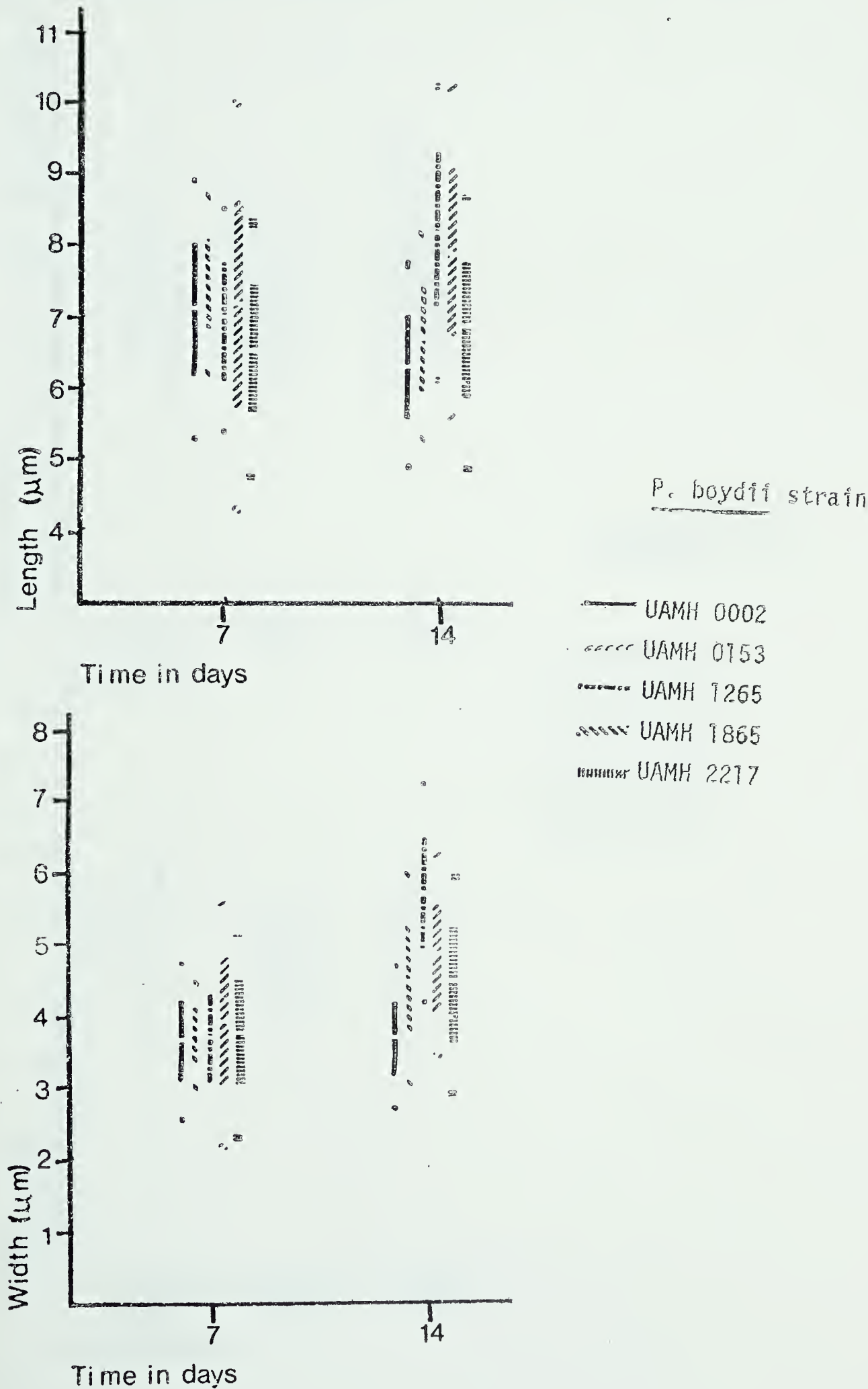


Fig. 5 Conidial measurements after 31 days incubation on Oat. at 18°C, 25°C and 30°C.

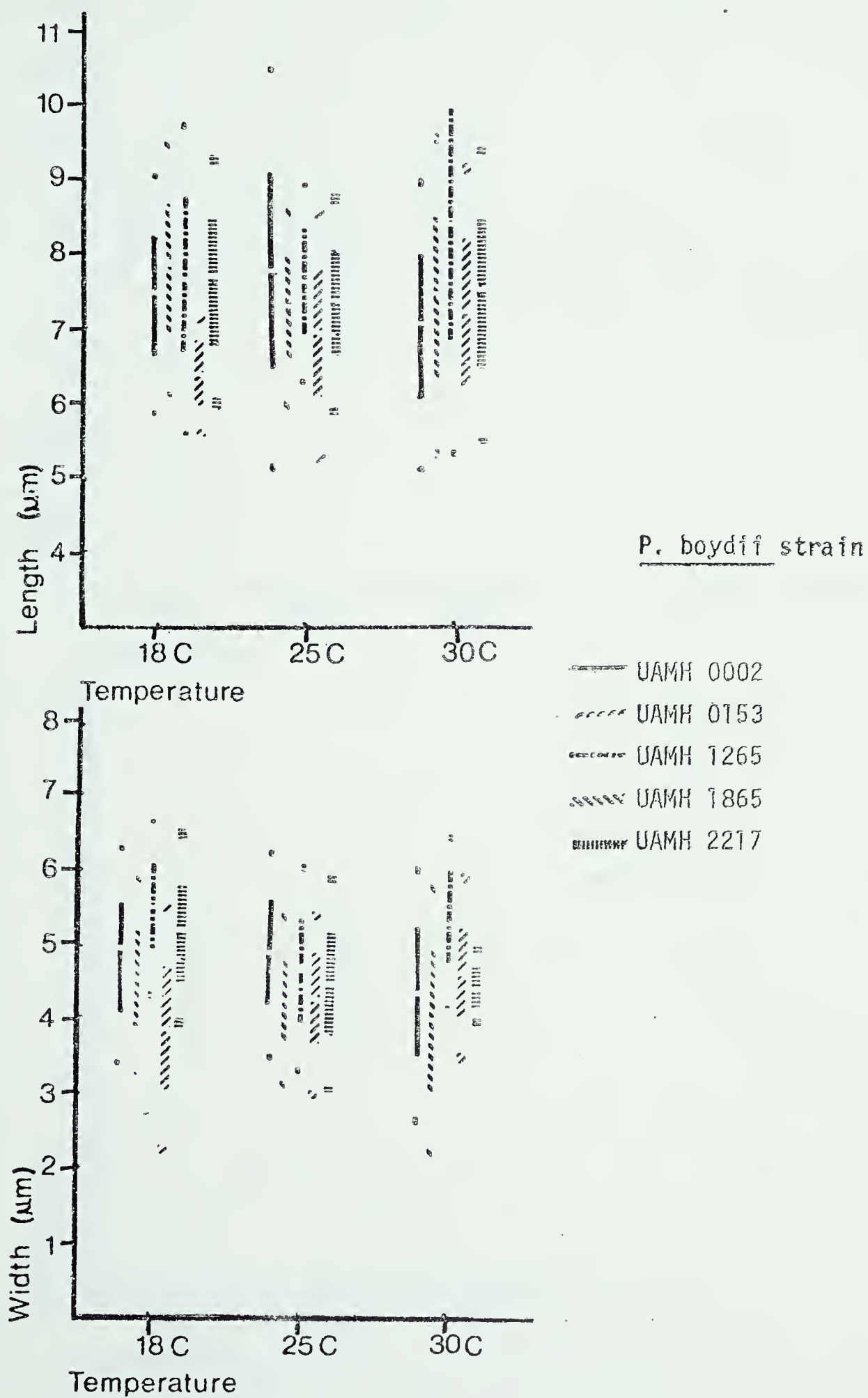


Fig. 6 Ascospore measurements after 31 days incubation on Oat. at 18°C, 25°C and 30°C.

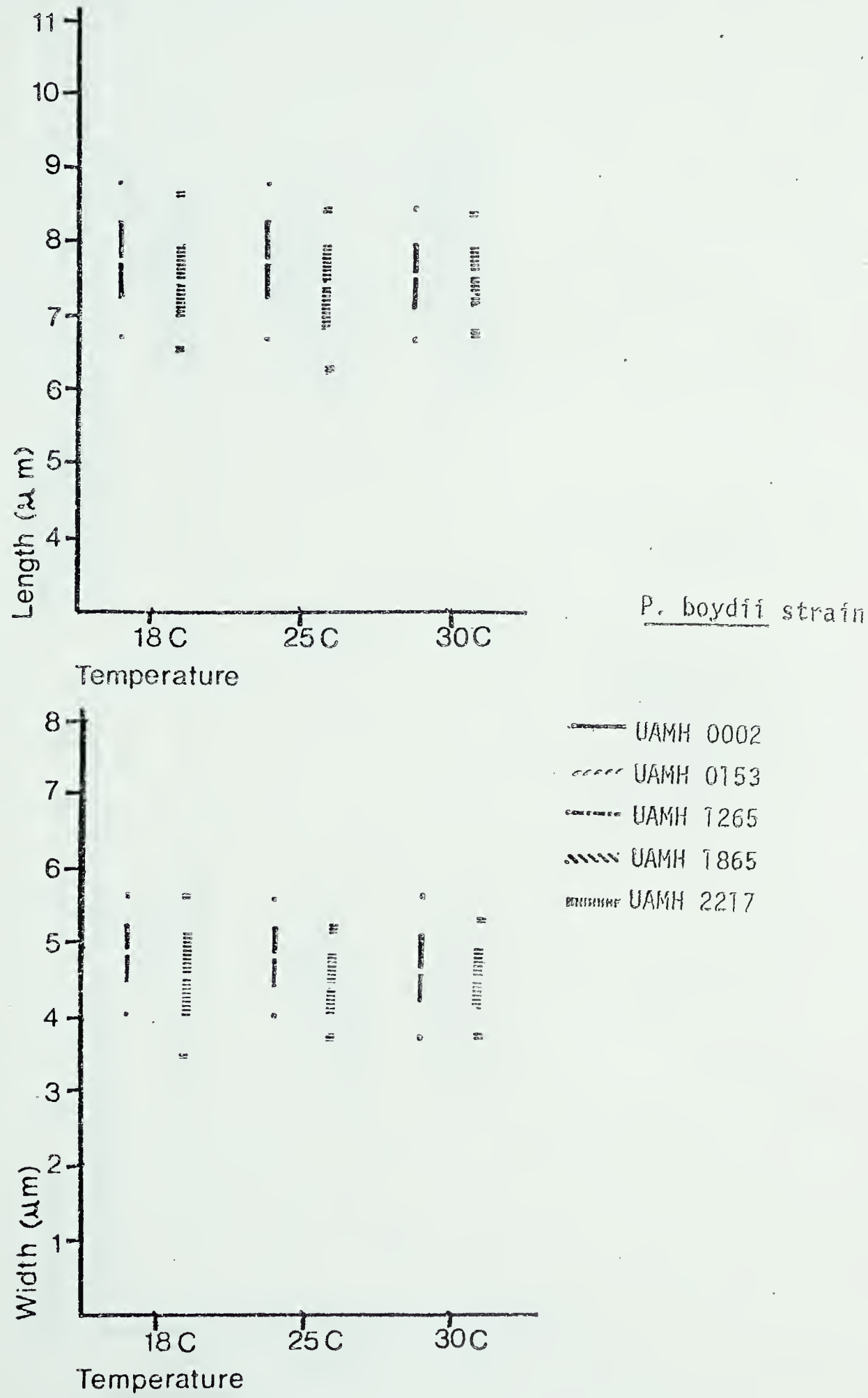


Fig. 7 Conidial measurements after two months incubation on Oat. at 18°C, 25°C and 30°C.

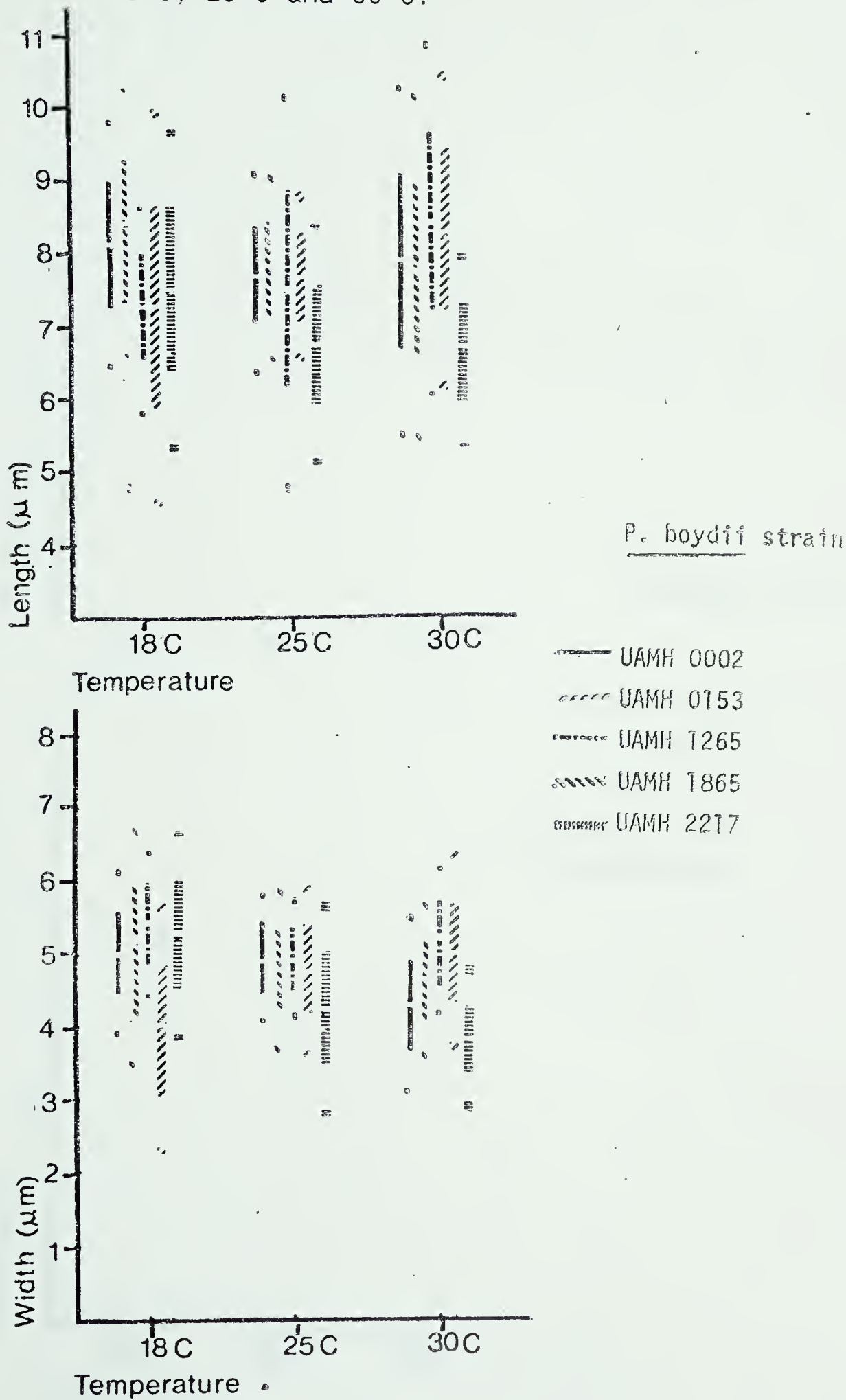


Fig. 8 Ascospore measurements after two months incubation on Oat. at 18°C, 25°C and 30°C.

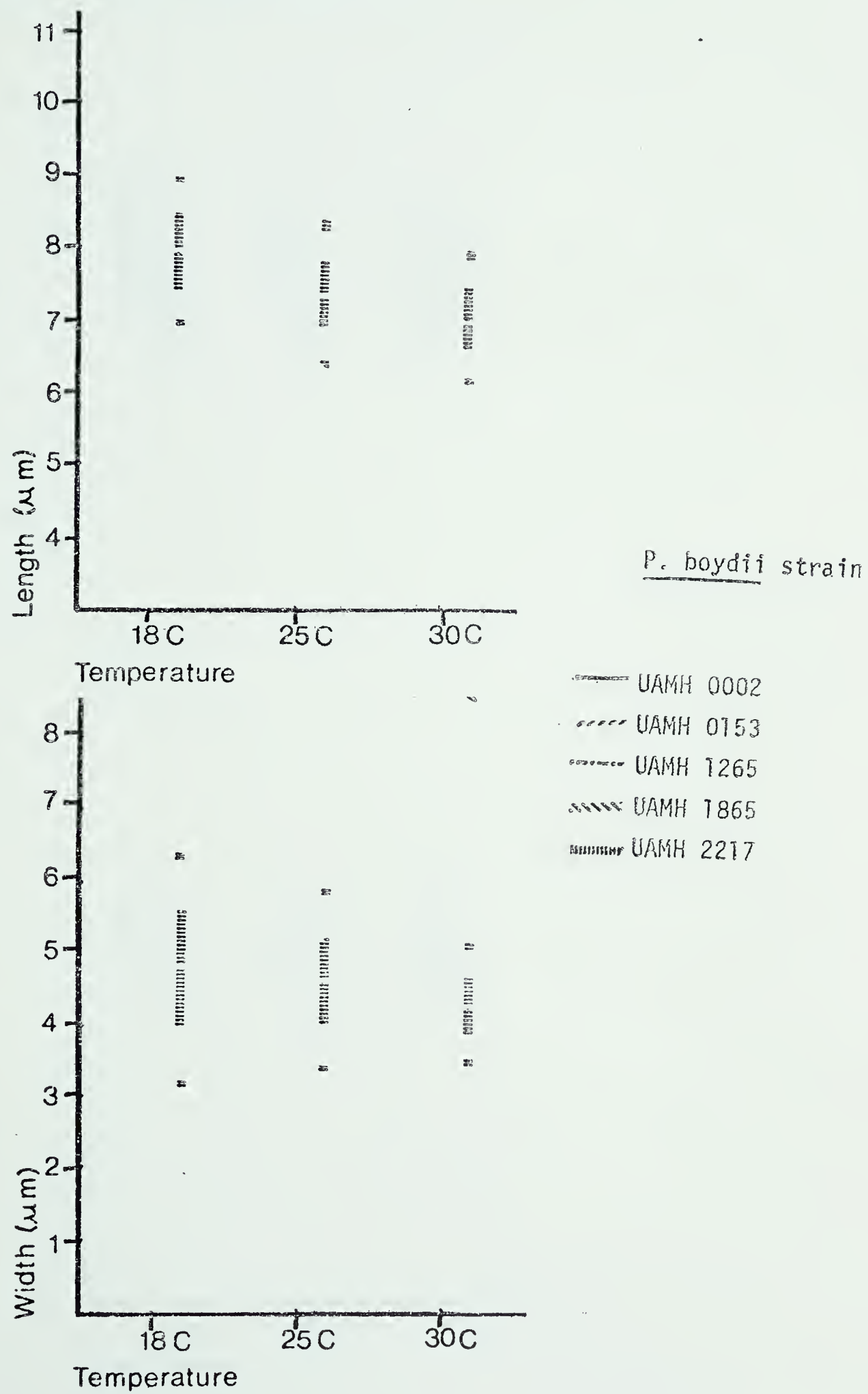


Fig. 9 Conidial measurements after 100 days incubation on Oat. at 18°C, 25°C and 30°C.

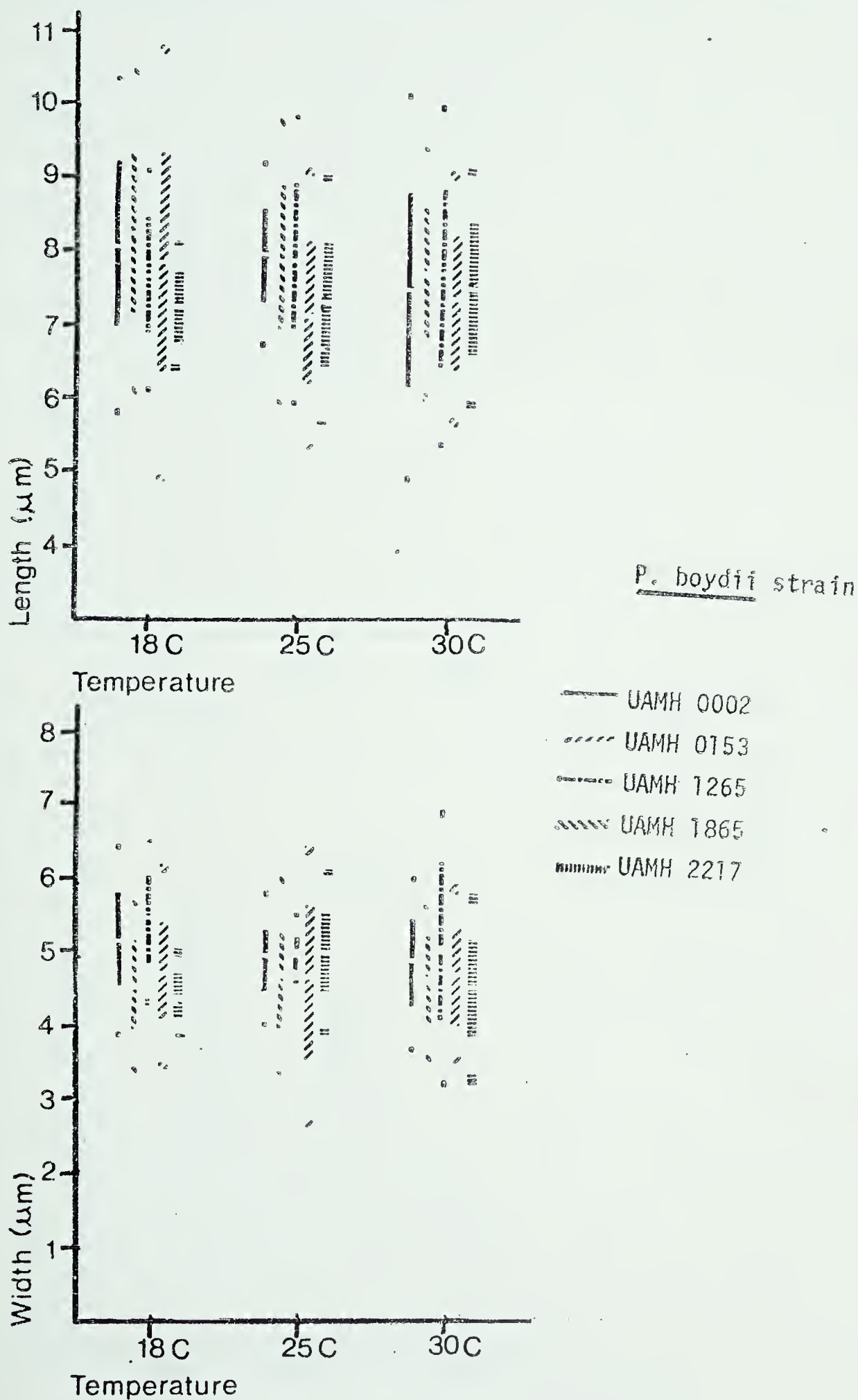
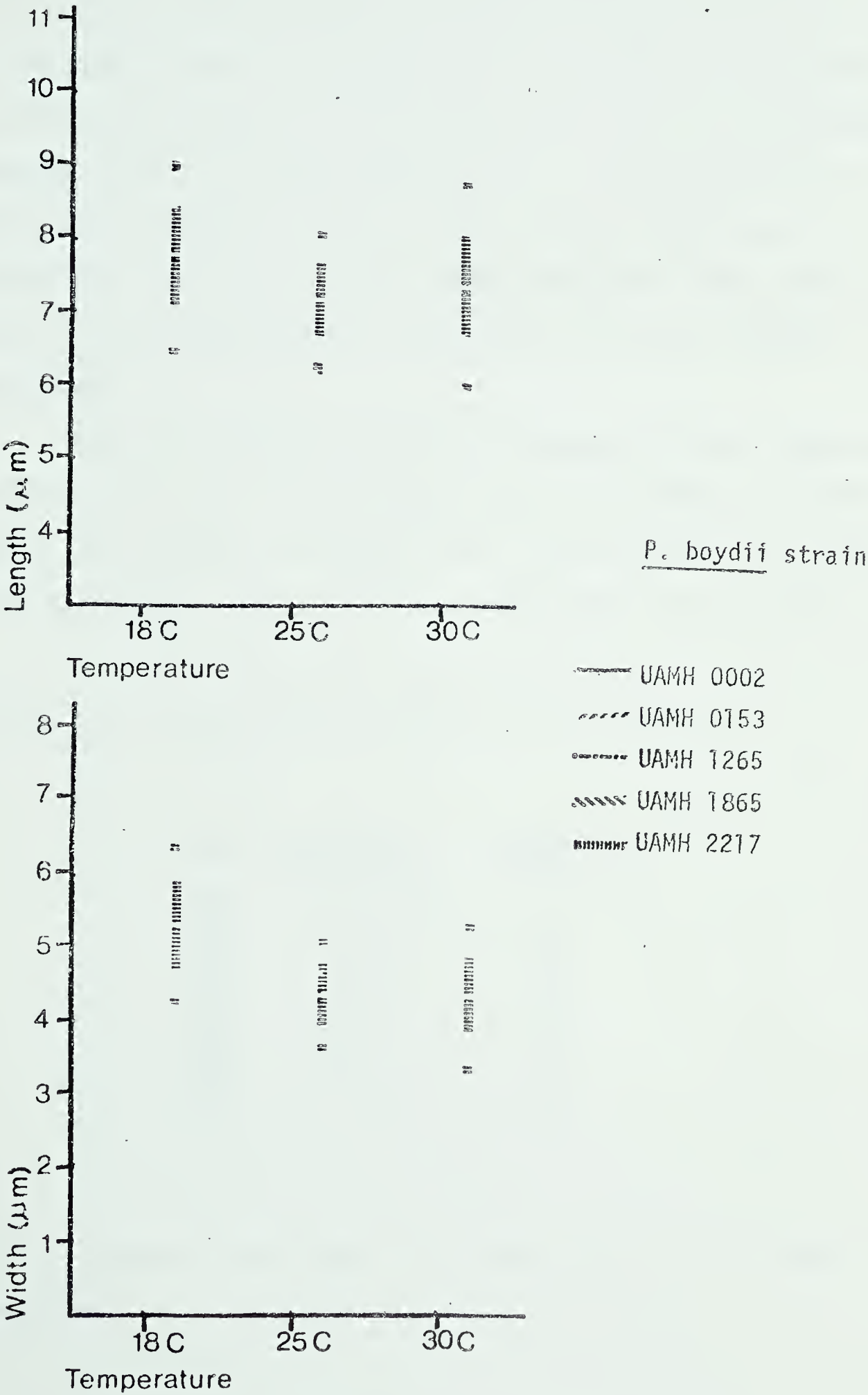


Fig. 10 Ascospore measurements after 100 days incubation on Oat. at 18°C, 25°C and 30°C.



which are not always contained within asci. This may account for part of the variation in ascospore size reported in the literature. Most investigators do not mention the number of ascospores examined to determine size range. Thus inadequate sample size is another possibility for the variation in reported ascospore size. In this study, measurements obtained from scanning electron micrographs were used to confirm the measurements obtained from camera lucida drawings.

As seen in Table 4, both the means and the ranges are quite uniform for all strains except UAMH 0002. In UAMH 0002, the length varied by 4 μ m. The intra-strain range is approximately 1 to 1.5 μ m in width and 2 μ m in length.

Table 4 Ascospore sizes obtained in this study

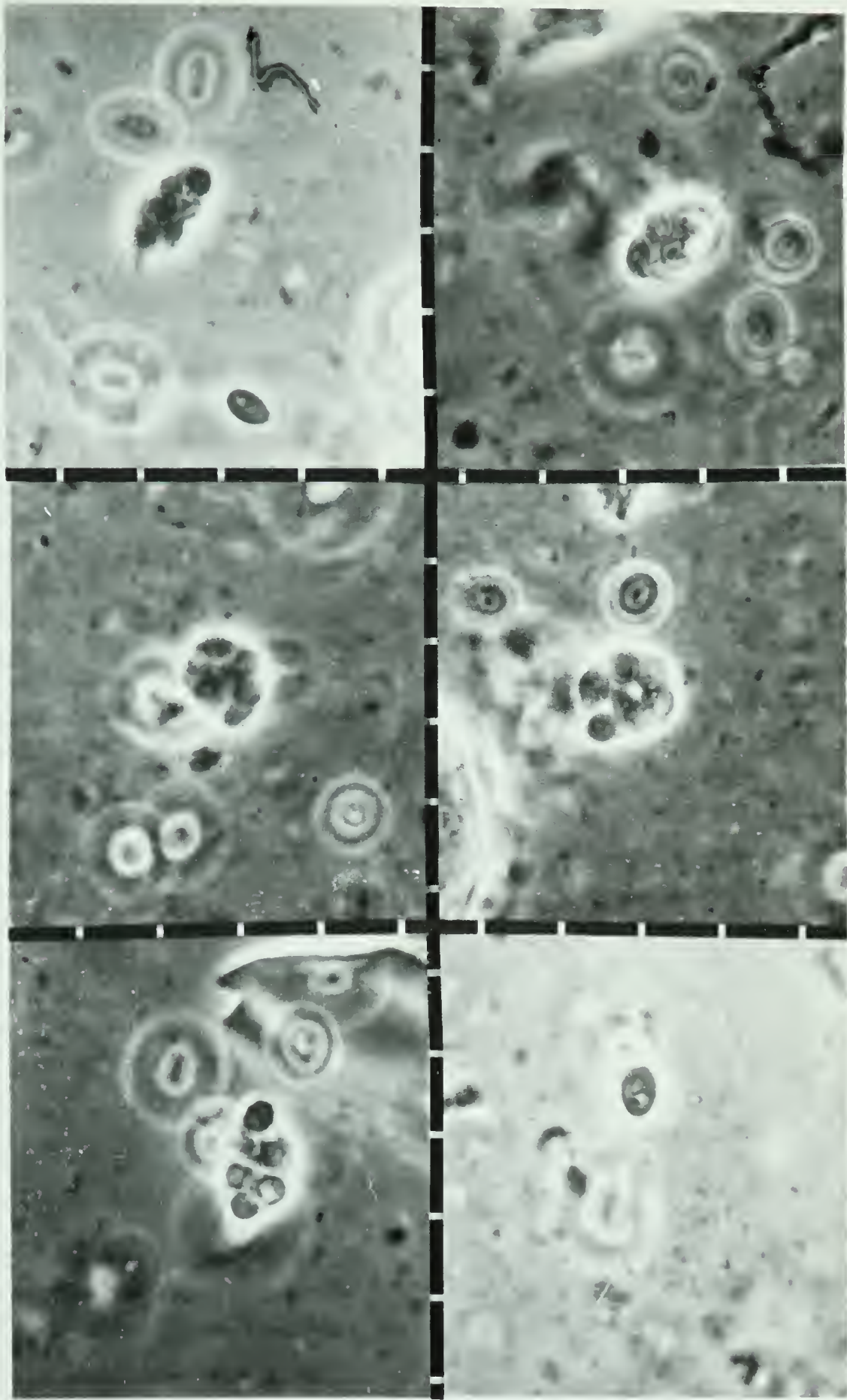
Strain	Length (μ m)						Width (μ m)					
	5	6	7	8	9	10	3	4	5	6	7	8
0002												
0153												
1265												
1855												
2217												
3239												
3872												
3873												
4302												
4303												
4304												
4408												

The ascospore size ranges are composites for all media employed.

Plate #1: Immature ascospores

Plate 1 consists of photographs of immature ascospores contained within asci (UAMH 2217). A solitary mature ascospore is shown in the lower right photograph.

(Magnification 1000x)



C. Effects of growth conditions on morphology and spore production

Many investigators have studied nutritional and temperature effects on *P. boydii* (Cazin and Decker 1964, Conti-Diaz 1965) . As Rippon (1974) states in his medical mycology text "Morphology, color, spore production and so forth are all affected by the particular media on which the organism is growing as well as other environmental factors" and he refers to Sabouraud agar as the traditional standard in medical mycology. Therefore Sabouraud medium was included in this study, even though it consistently gave the poorest results. Growth was slow; cleistothecia and coremia were seldom produced, and conidial production for some strains was scant or absent. Oatmeal agar was found to be the best medium for production of the three states. The descriptions of cultural characteristics from four media employed provided a set of standard descriptions on which comparisons could be made.

The culture medium has been shown to affect cleistothecium production (Gordon 1957). This was reflected in this study. Cleistothecium abundance and position, (i. e. submerged in the agar, within the hyphal mat or in the upper layer of hyphae) were seen to vary with the medium used. The most abundant cleistothecium production was found with PYE agar. However the cleistothecia were within the hyphal mat and could not be detected unless the mat was cut to expose the cleistothecia. Also the ascospore maturation rate was

considerably slower on this medium, so intact asci were evident for longer periods of time than with the other media.

Temperature was also seen to affect cleistothecium production. On Oatmeal agar, cleistothecia were not produced when incubation was at temperatures of 37°C or higher. The optimum temperature for cleistothecium production ranged from 25°C to 30°C.

All attempts to induce non-cleistothecium producing strains to produce ascocarps failed. (See Materials and Methods for procedures used.)

D. Results of ascospore germination studies

The *Petriellidium* and *Petriella* ascospores germinated from only one end of the ascospore. *Petriellidium fimeti* was the only exception, germinating from both germ pores. The significance for classification is not known.

E. Viral studies

The electron microscopic study of *P. boydii* strain UAMH 2324 for viral particles did not yield conclusive results. An unusual formation within the cells was found (Plate 2). A dense mass of compact granular material at times quite large, almost filling the cell was seen. It is not known whether this mass represents a proviral state or is some component of the fungus. No further attempts were made to determine its nature. Viral infections of Ascomycetes have

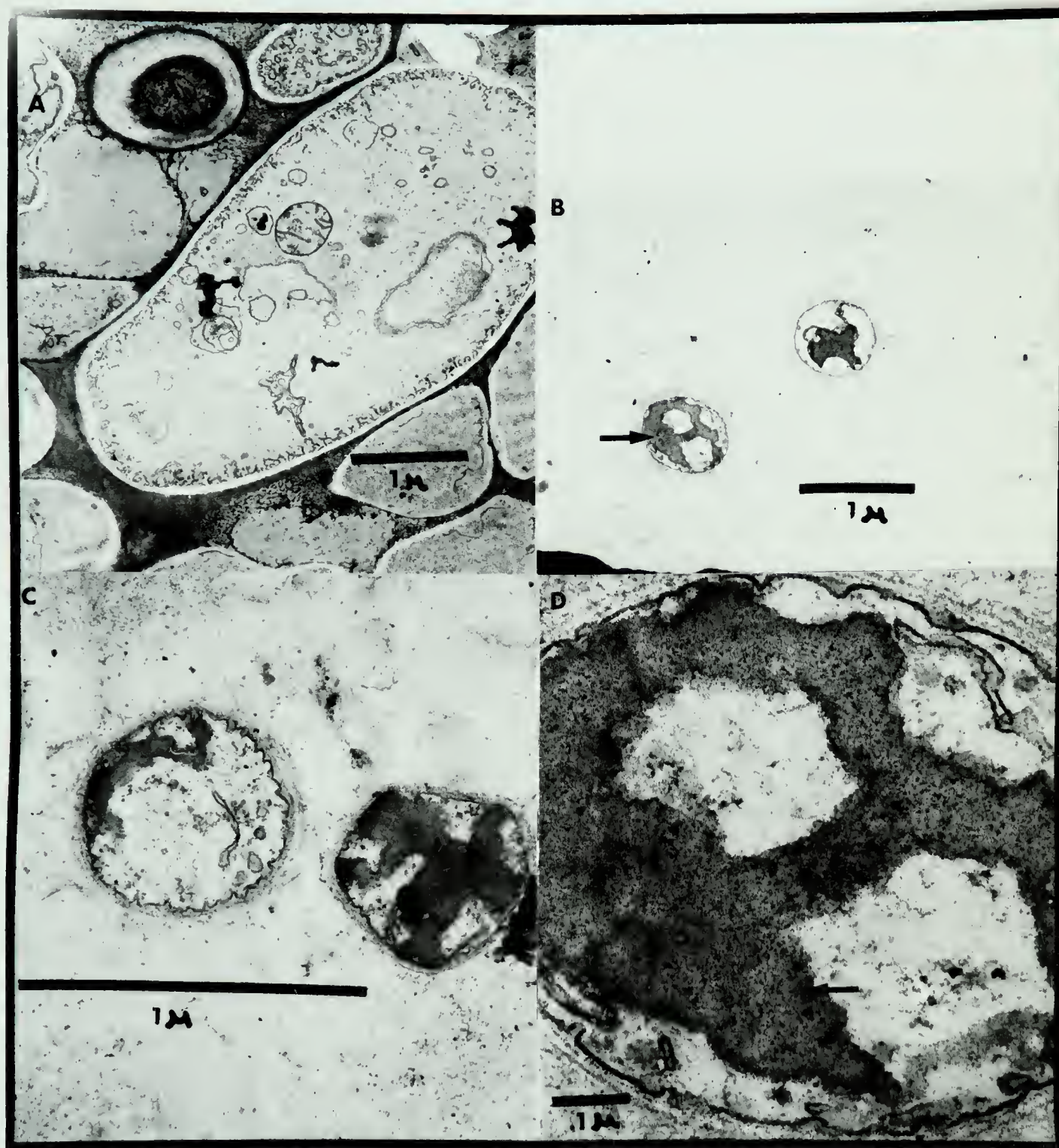
been described (Bozarth 1979, Weber 1979).

Plate #2: Viral Studies by Electron Microscopy

a-control cell of *P. boydii* UAMH 0002

b,c-two UAMH 2324 cells containing dense granules (arrow)

d-a magnification of one of the cells shown in b



F. Results: Strain descriptions

The strains examined in this study are described in this section by a standardized description form and plate of photographs for each strain. The description indicates first the species name (as finally identified in this study), the UAMH number and information of its source, isolator and original identification as well as the date received by the UAMH Culture Collection. Pictorial descriptions are given for colony growth at four (magnification 16x) and 28 days (magnification .9x). Written descriptions are given to describe the colony colour and reverse. The growth rates on the four media and on Oat. at different temperatures are represented as graphs. The microscopic characters are represented by pictures and measurements. Not all strains previously producing ascospores produced the ascocarpic state during this survey. As a result, the SEM photographs for these strains and, in a few cases ascocarp measurements are absent. Comments, if necessary, are included to further describe the strain. These descriptions also serve as legends for the plates.



Plate #3: *Petriellidium boydii* UAMH 0002

Isolated from mycetoma, leg, Edmonton, 1934 by E. S.

Dowding

Entered 1954 as *Allescheria boydii*

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. mouse brown/light(mod. dark)
 - 2) Cer- Dark mouse brown/none
 - 3) PYE- Mod. mouse brown/dark gold-green
 - 4) Sab- Lt. mouse brown/pale cream green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-9.5 x 3.5-6 μ m Figs. N,R
- b. Synnemalous conidia- 4.5-8 x 2-3 μ m Figs. O,S
- c. Ascocarps- 77-111.5 μ m dia. Figs. P,U
- d. Ascospores- 6.5-10.5 x 4-5.5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* strain.

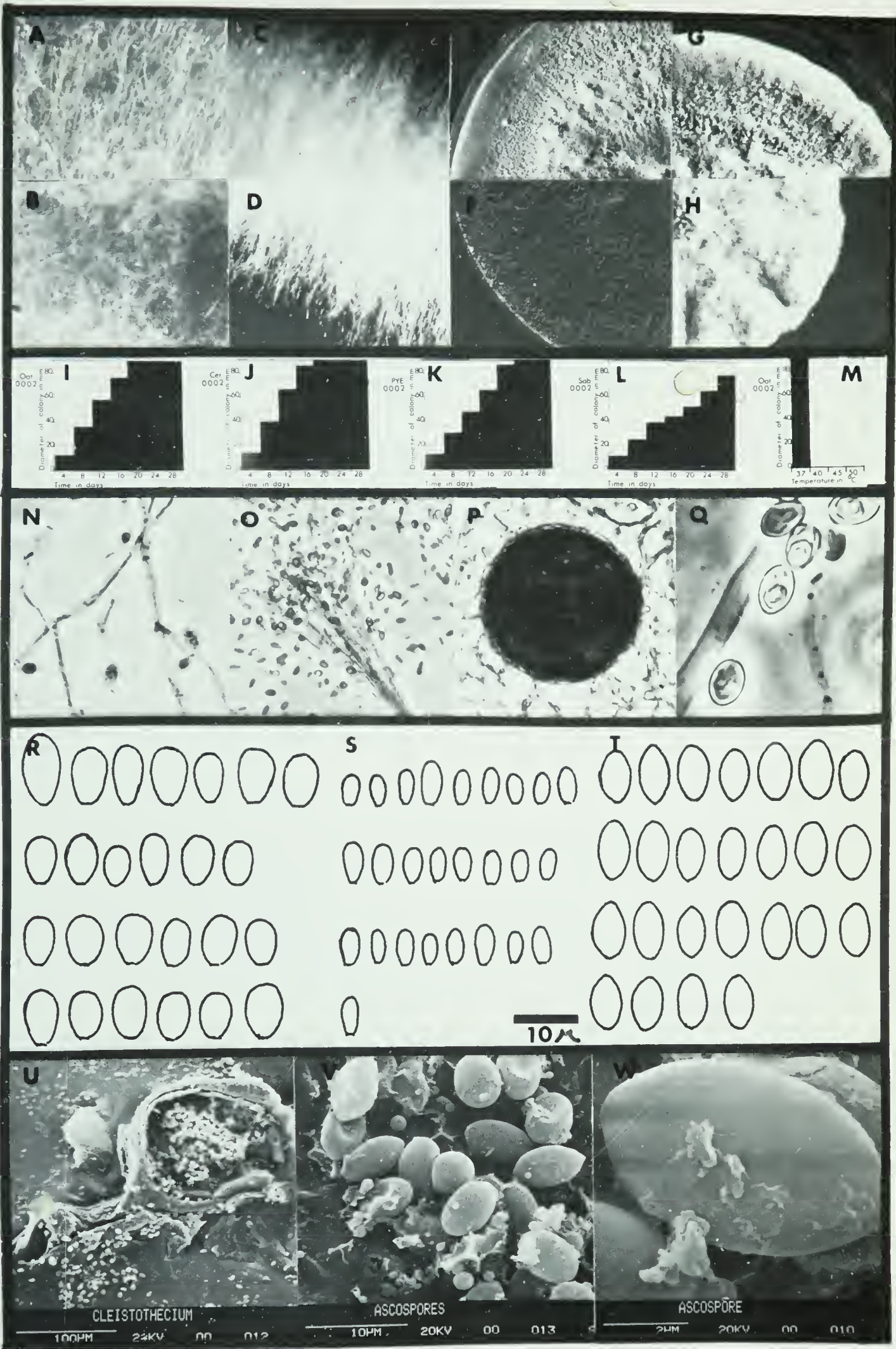




Plate #4: *Petriellidium boydii* UAMH 0153

Isolated 1947 by Conant

Received 1954 from Conant as *Graphium*

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown-gray/mod dark
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Lt. mouse brown-flesh/mod yellow green
 - 4) Sab- Lt. tan/pale cream green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-9.5 x 3.5-6 μ m Figs. N,R
- b. Synnemalous conidia- 4.5-8 x 1.5-3 μ m Figs. O,S
- c. Ascocarps- 55.5-86 μ m dia. Figs. P,U
- d. Ascospores- 6-8.5 x 3.5-5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* strain.

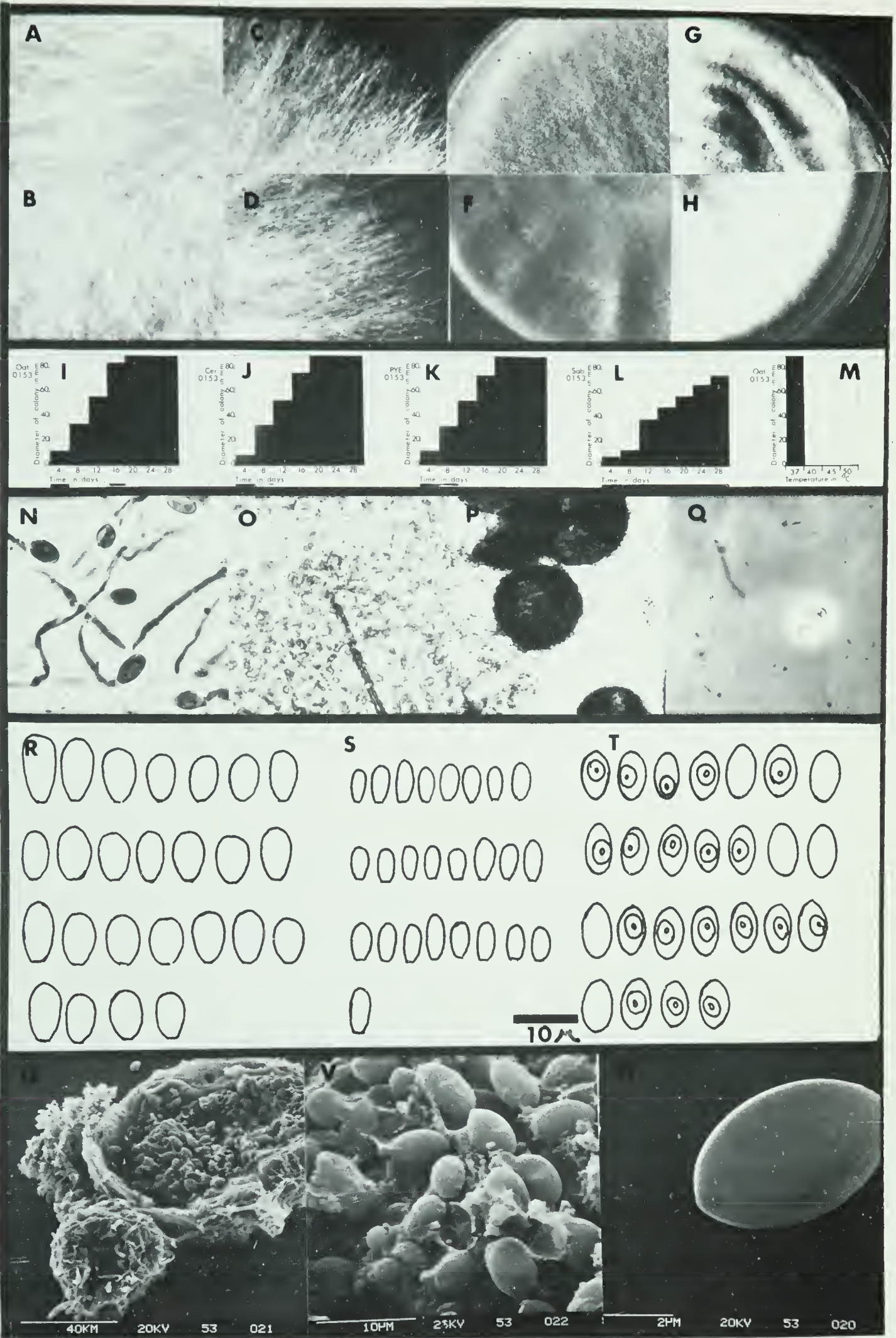




Plate #5: *Petriellidium boydii* UAMH 0800

Isolated by Ciferri

Received 1960 from CBS as *Glenospora graphii* strain

Ciferri

1. Colonies

- | | | |
|----|--|-----------|
| a. | 4 days on Oat Cer PYE and Sab | Figs. A-D |
| b. | 21 days on Oat Cer PYE and Sab | Figs. E-H |
| c. | Colour at 28 days (Surface/Reverse) | |
| | 1) Oat- Lt. camel/dark | |
| | 2) Cer- Lt. mouse brown/greenish | |
| | 3) PYE- Lt. mouse brown/gold-lt. brown | |
| | 4) Sab- Lt. mouse-brown/dark brown | |

2. Growth Rates

- | | | |
|----|----------------------------------|-----------|
| a. | at 25°C on different media | Figs. I-L |
| b. | at different temperatures on Oat | Fig. M |

3. Microscopic Characters

- | | | |
|----|--|---------------|
| a. | Diffuse conidia- 6-9.5 x 3.5-5 μ m | Figs. N,R |
| b. | Synnematous conidia- not seen | Figs. O,S |
| c. | Ascocarps- not seen | Figs. P,U |
| d. | Ascospores- not seen | Figs. Q,T,V,W |

4. Comments

Although this strain was originally identified as *Glenospora graphii*, it now produces only the *Scedosporium* state. This is a typical *P. boydii* anamorph.

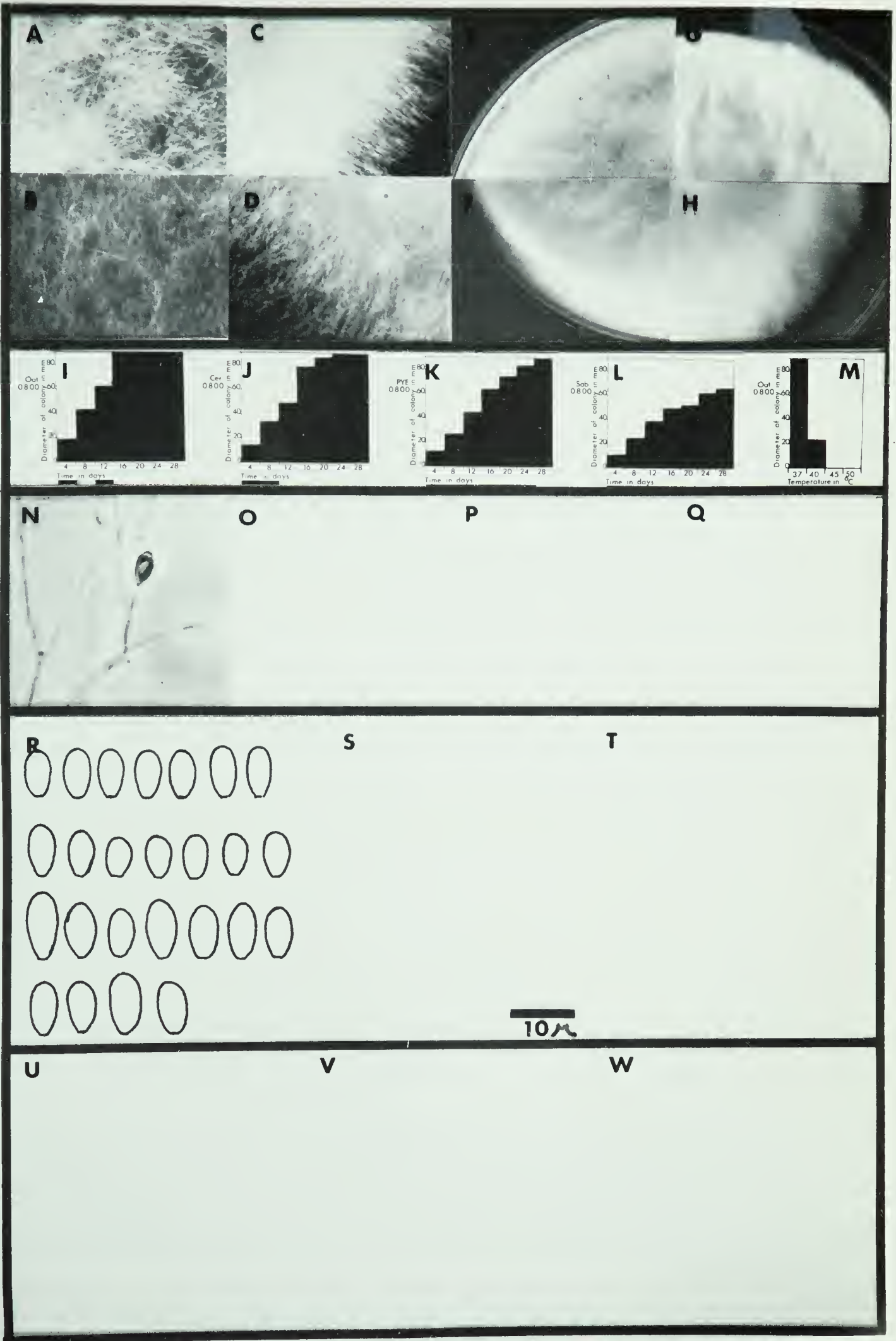




Plate #6: *Petriellidium boydii* UAMH 1099

Isolated from mycetoma, California, by G. F. Orr

Received 1961 from Orr as *Allesheria boydii* UCLAB-M-55

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown/dark
 - 2) Cer- Lt. mouse brown/greenish
 - 3) PYE- Mod. mouse brown/dark olive-green
 - 4) Sab- Mod. grey/deep blue to dark green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-10 x 3.5-5.5 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

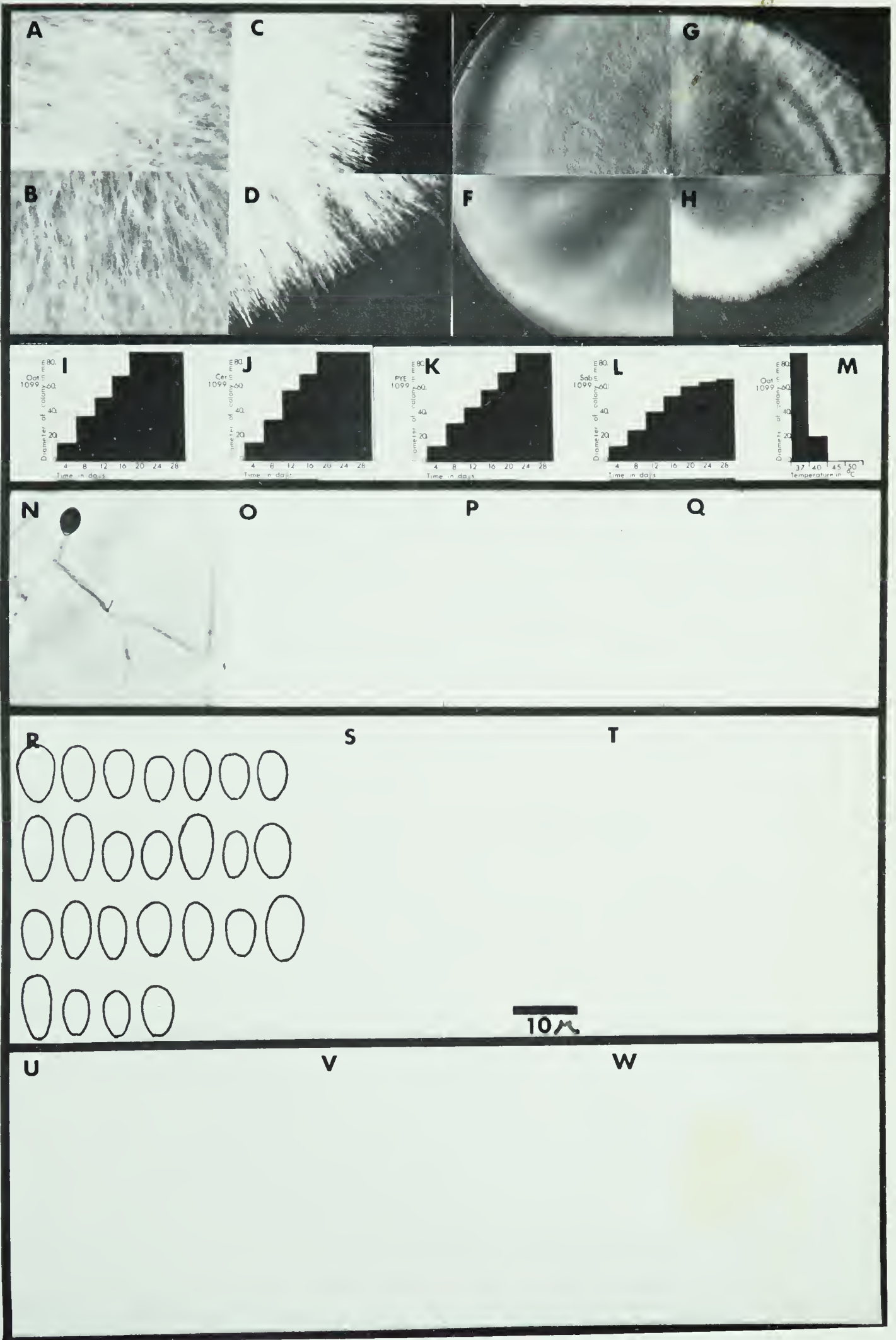


Plate #7: *Petriellidium boydii* UAMH 1265

Isolated from ear canal, chronic otitis media,
Edmonton, 1962 by J. W. Carmichael

Entered 1962 as *Allescheria boydii* P62-1582,

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Off white/light
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Mod. mouse brown/gold-tan
 - 4) Sab- Lt. mouse brown-grey/cream-pale green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-9.5 x 3.5-5 μ m Figs. N,R
- b. Synnematos conidia- 4.5-7.5 x 2-3 μ m Figs. O,S
- c. Ascocarps- 98-145.5 μ m dia. Figs. P,U
- d. Ascospores- 6.5-8.5 x 3.5-5.5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* strain.

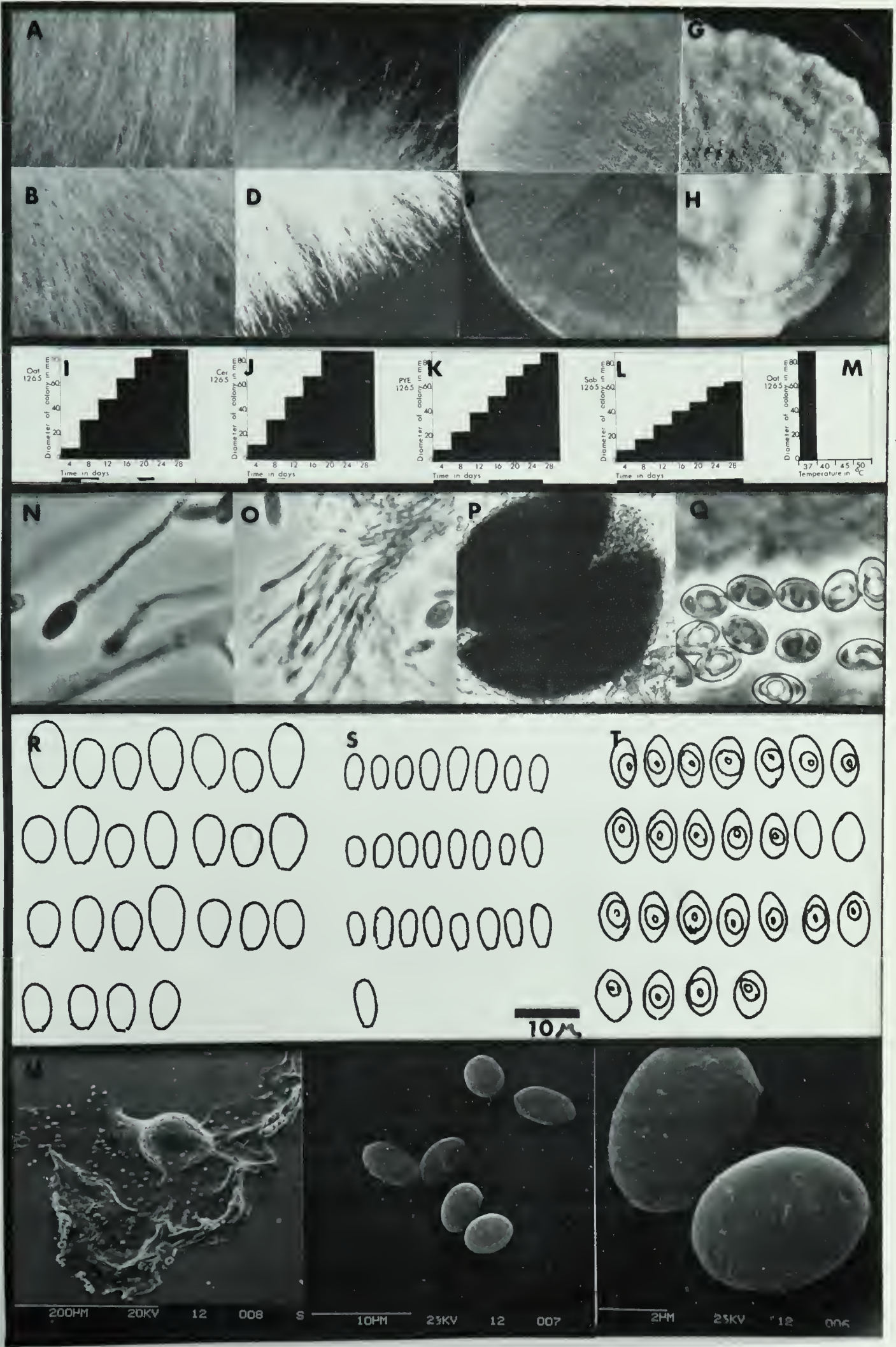




Plate #8: *Petriellidium boydii* UAMH 1865

Isolated by G. F. Orr

Received 1963 from Orr as *Didymostilbe* PV1

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Off white/light
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Off white/yellow
 - 4) Sab- Off white/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-10 x 3.5-6 μ m Figs. N,R
- b. Synnematus conidia- 4.5-7.5 x 2-3 μ m Figs. O,S
- c. Ascocarps- 103 μ m dia. Figs. P,U
- d. Ascospores- 6.5-8.0 x 4-5.5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* strain.

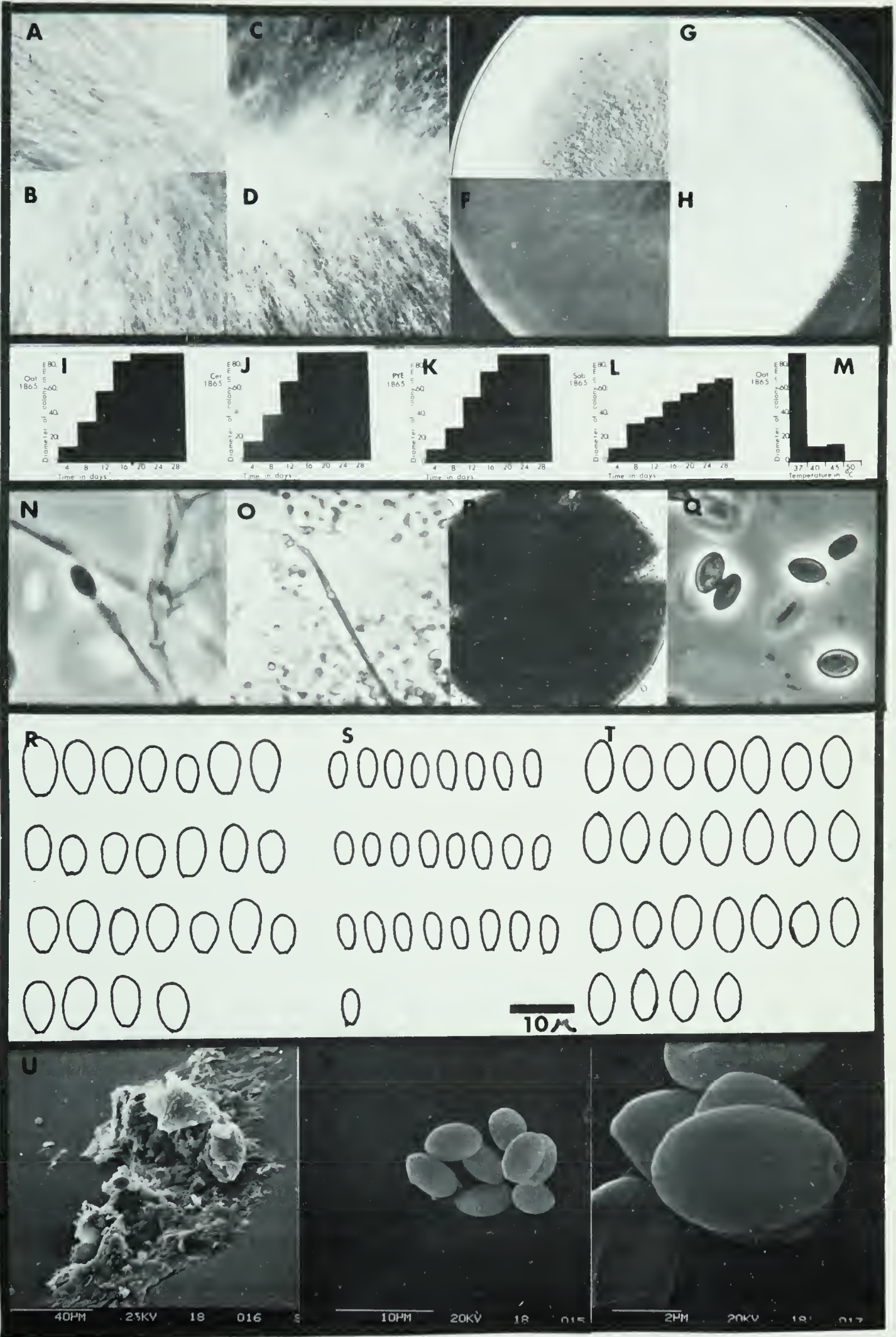


Plate #9: *Petriellidium boydii* UAMH 2217

Isolated from right ear, Edmonton, 1964 by J. W.

Carmichael

Entered 1964 as *Allescheria boydii* My2820-64

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown/mod. dark
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Mod. mouse brown/dark gold
 - 4) Sab- Off white/pale yellow green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-8.5 x 3.5-5.5 μ m Figs. N,R
- b. Synnemalous conidia- 4-7 x 2-2.5 μ m Figs. O,S
- c. Ascocarps- 101-155.5 μ m dia. Figs. P,U
- d. Ascospores- 6.5-8.5 x 4-5.5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* strain.

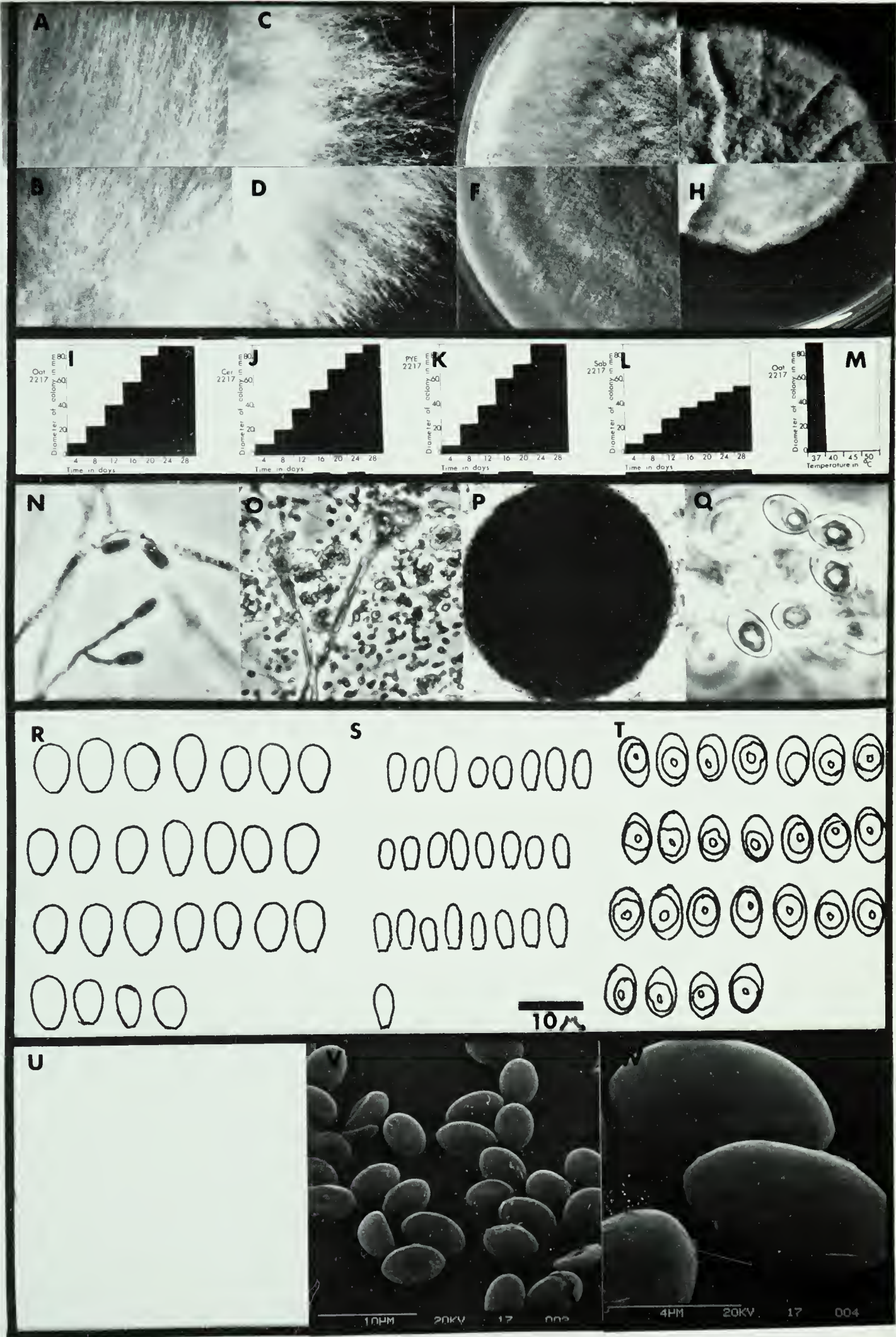


Plate #10: *Petriellidium boydii* UAMH 2324

Isolated from mycetoma, Venezuela, 1922 by D. Borelli

Received 1965 from Borelli as *Monosporium apiospermum*

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Clear/none
 - 2) Cer- Clear/none
 - 3) PYE- White/cream
 - 4) Sab- Pale cream gold/pale cream gold

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5-8 x 3-5 μ m Figs. N,R
- b. Synnematus conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This strain has a "sick" appearance, aerial hyphae are seldom produced.

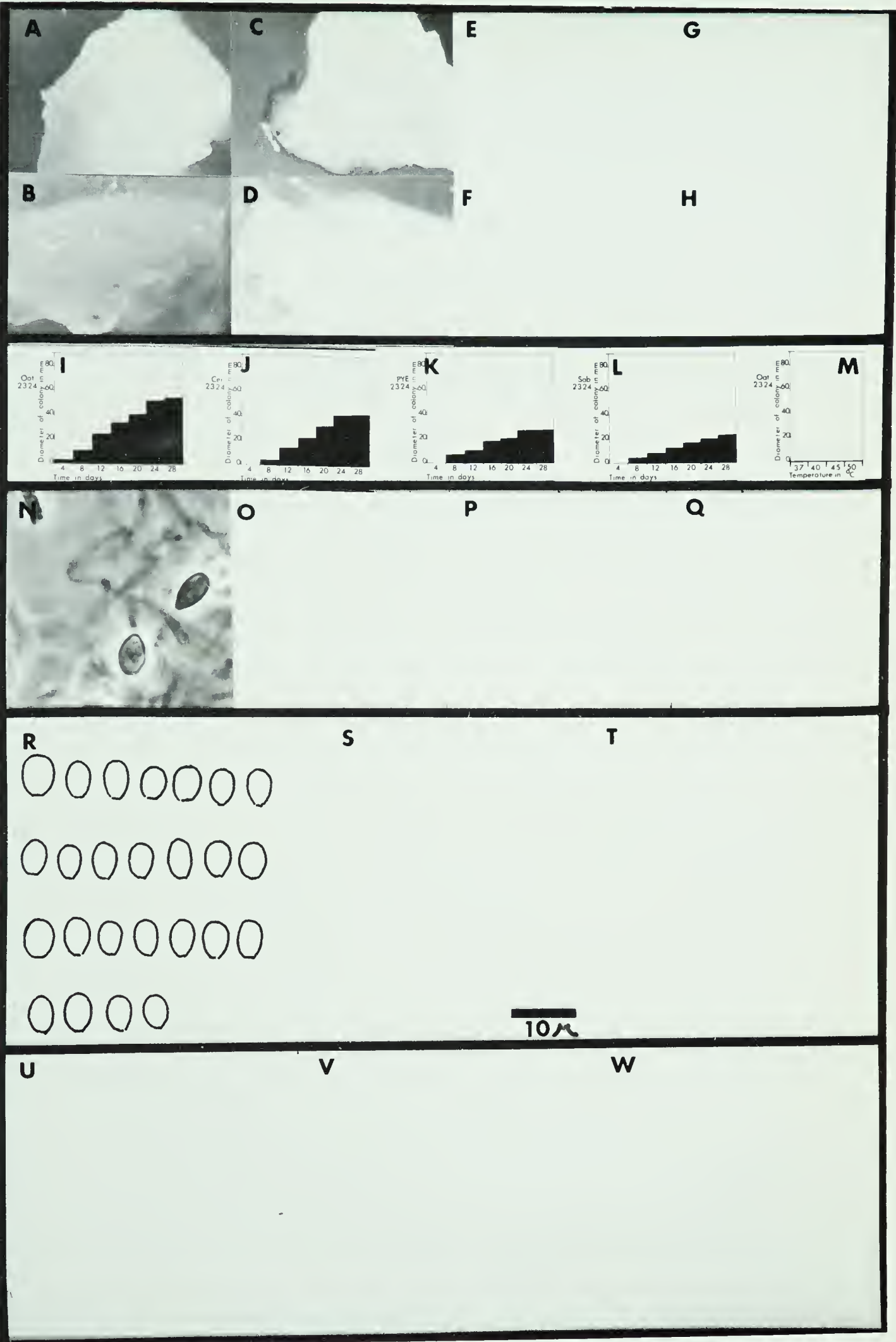




Plate #11: *Petriellidium boydii* UAMH 2507

Isolated 1963 by G. F. Orr

Received 1965 from Orr as *Chrysosporium species* O-3024

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. mouse brown(lt. grey)/mod. dark
 - 2) Cer- Off white/none
 - 3) PYE- Off white/mod. cream green
 - 4) Sab- Off white/mod. yellow with lt. brown(cream lt. tan)

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-9 x 3.5-5.5 μ m Figs. N,R
- b. Synnematus conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

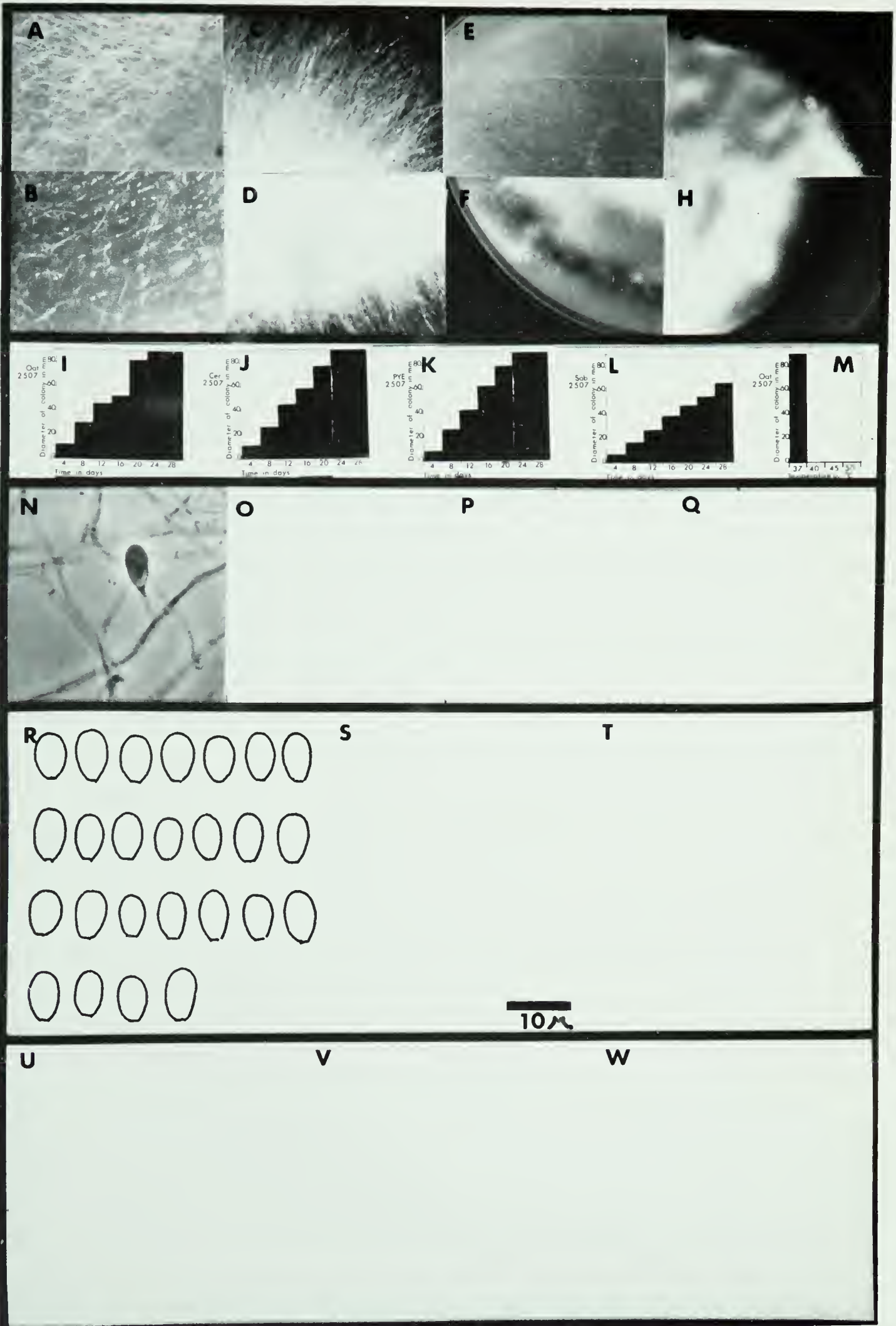




Plate #12: *Petriellidium boydii* UAMH 2975

Isolated from bronchial washings, Alberta, 1968 by J.
W. Carmichael

Entered 1968 as *Allescheria boydii* My 2632

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. olive green/light
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Lt. mouse brown(dark mouse brown)/gold
yellow
 - 4) Sab- Lt. mouse brown/mod. olive green(cream
green)

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6.5-10.5 x 3.5-5.5 μ m Figs. N,R
- b. Synnemalous conidia- 6.5-13.5 x 2.5-4.5 μ m Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

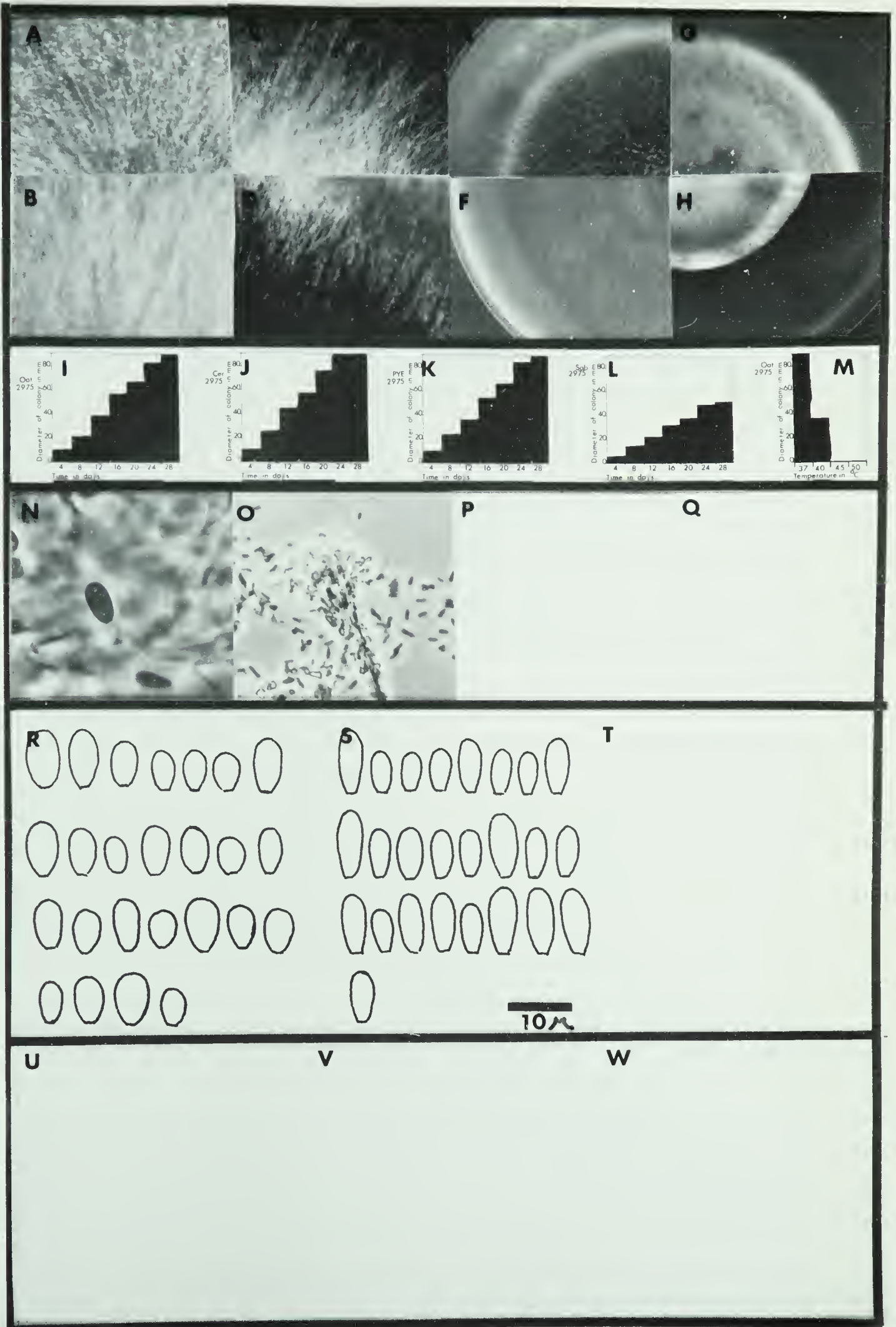




Plate #13: *Petriellidium boydii* UAMH 3230

Isolated from turkey corrals (litter), Ontario,
California, 1969 by J. W. Carmichael

Entered 1969 as synnematosus fungus

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. grey/dark
 - 2) Cer- Lt. mouse brown(lt. grey)/greenish
 - 3) PYE- Lt. mouse brown(mod. mouse brown)/gold tan
 - 4) Sab- Off white/dark yellow-green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-8.5 x 3-5 μ m Figs. N,R
- b. Synnematosus conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

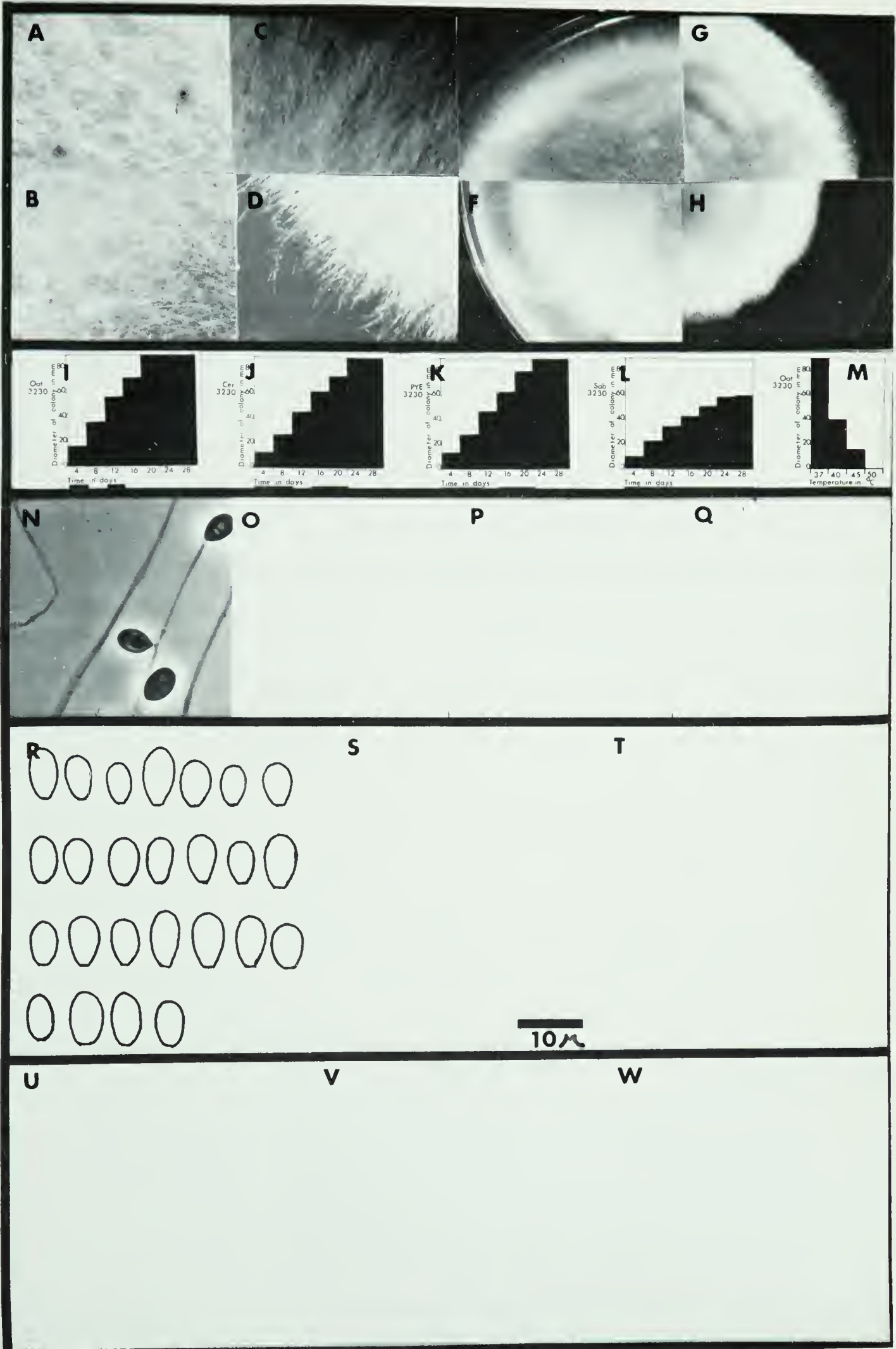




Plate #14: *Petriellidium boydii* UAMH 3239

Isolated from under chicken pens, Ontario, California,
1969 by J. W. Carmichael

Entered 1969 as *Stilbaceae* 53-10-6

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown/mod. dark
 - 2) Cer- Mod. mouse brown/none
 - 3) PYE- Lt mouse brown-grey/pale yellow green
 - 4) Sab- Off white/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6.5-9.5 x 3.5-5.5 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- 66.5-99.5 μ m dia. Figs. P,U
- d. Ascospores- 6.5-8 x 4-5.5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

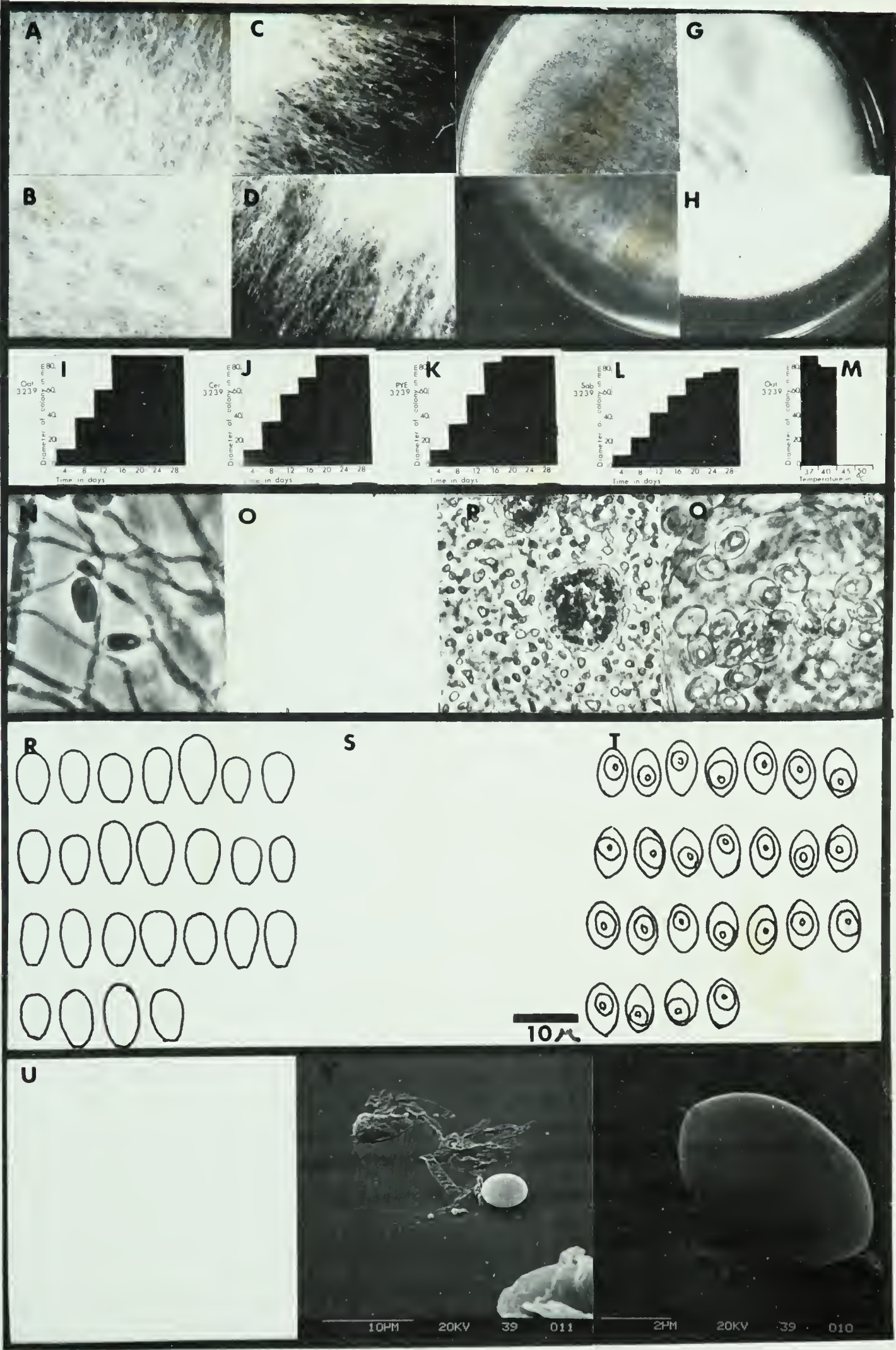


Plate #15: *Petriellidium boydii* UAMH 3746

Isolated from manure, Lethbridge, 1974 by R. G. Bell

Received 1974 from Bell as *Chrysosporium species* 25M

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown/dark
 - 2) Cer- Mod. mouse brown/none
 - 3) PYE- Mod. mouse brown(dark mouse brown)/yellow(cream green)
 - 4) Sab- Mod. mouse brown-grey(lt.)/pale cream green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-8 x 3.5-5 μ m Figs. N,R
- b. Synnematus conidia- 5-8.5 x 2-3 μ m Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

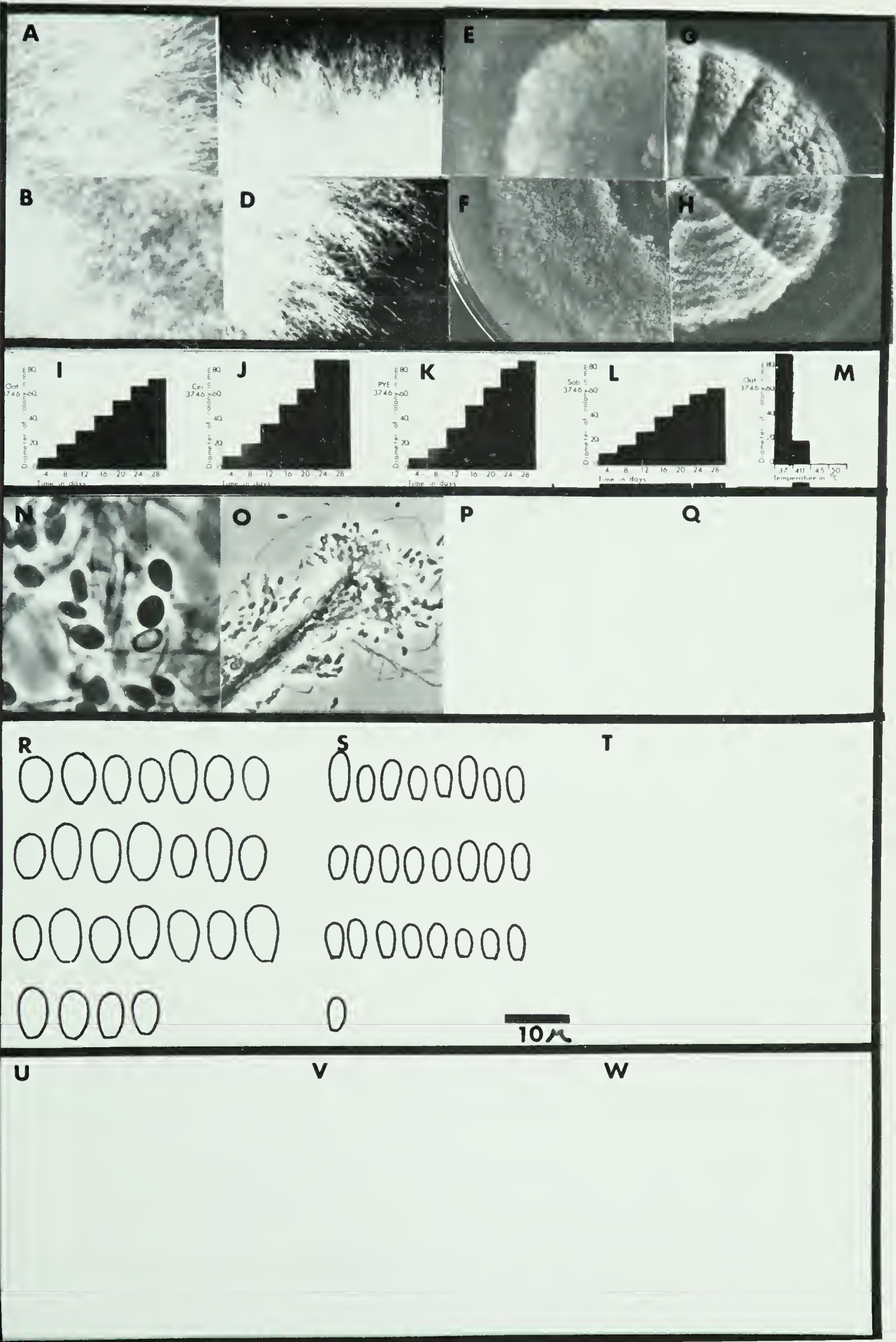




Plate #16: *Petriellidium boydii* UAMH 3749

Isolated from cattle manure, Lethbridge, 1974 by R. G. Bell

Received 1974 from Bell as *Petriella setifera* TM

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark grey(mod. to dark mouse brown)/orange
 - 2) Cer- Dark mouse brown/orange
 - 3) PYE- Lt. grey/dark burnt orange
 - 4) Sab- Lt grey-flesh/dark burnt orange

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-8.5 x 3-5 μ m Figs. N,R
- b. Synnemalous conidia- 4.5-7.5 x 1.5-2.5 μ m Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph, although the production of orange pigment is evident.

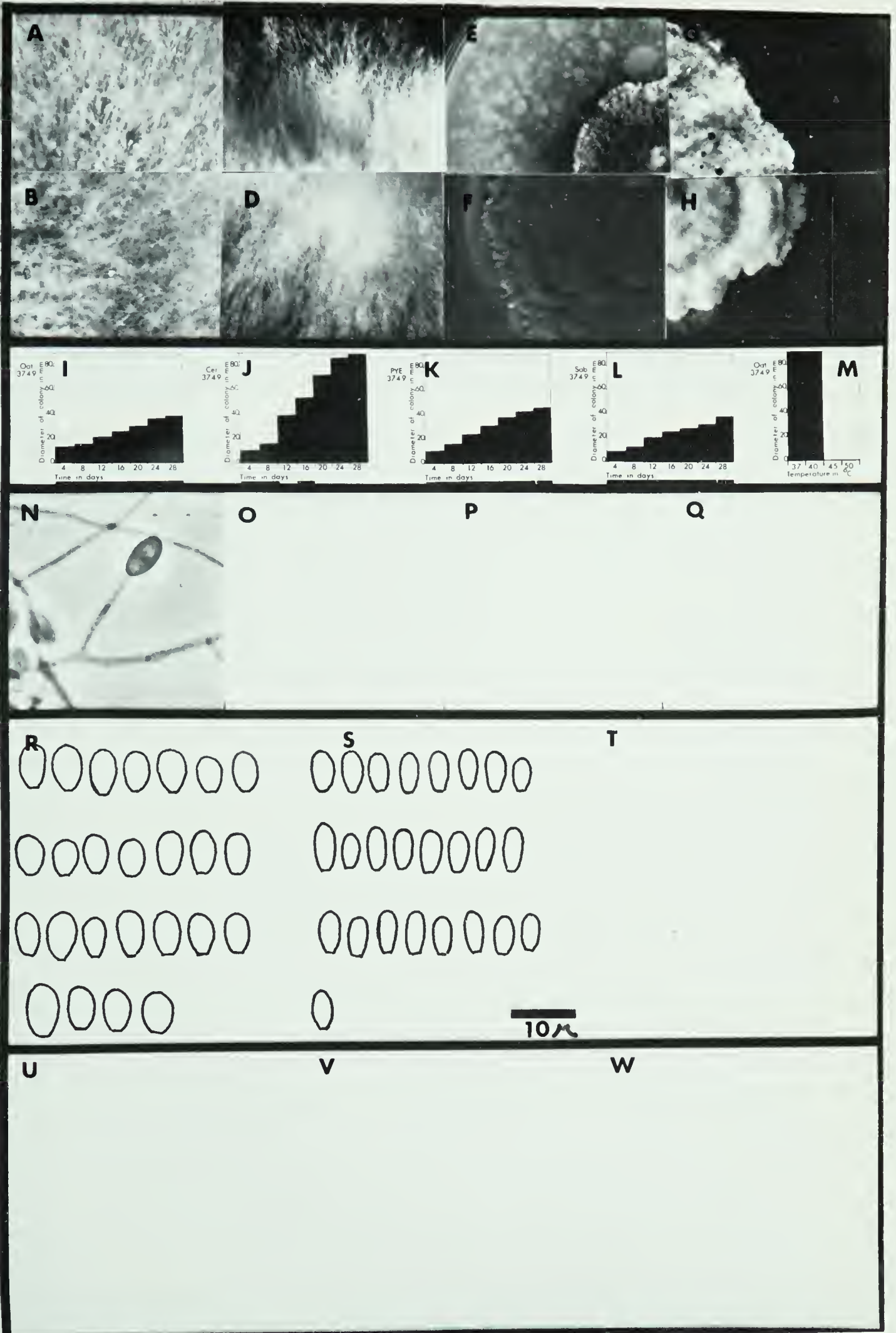




Plate #17: *Petriellidium boydii* UAMH 3750

Isolated from cattle manure, Lethbridge, 1974 by R. G. Bell

Received 1974 from Bell as *Petriella setifera* M37

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown-grey/mod. dark
 - 2) Cer- Lt. mouse brown(lt. grey)/none
 - 3) PYE- Lt. mouse brown(lt. grey)/yellow-lt. gold
 - 4) Sab- Off white/pale cream green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-8.5 x 3.5-5.5 μ m Figs. N,R
- b. Synnemalous conidia- 5.5-8 x 2-3.5 μ m Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

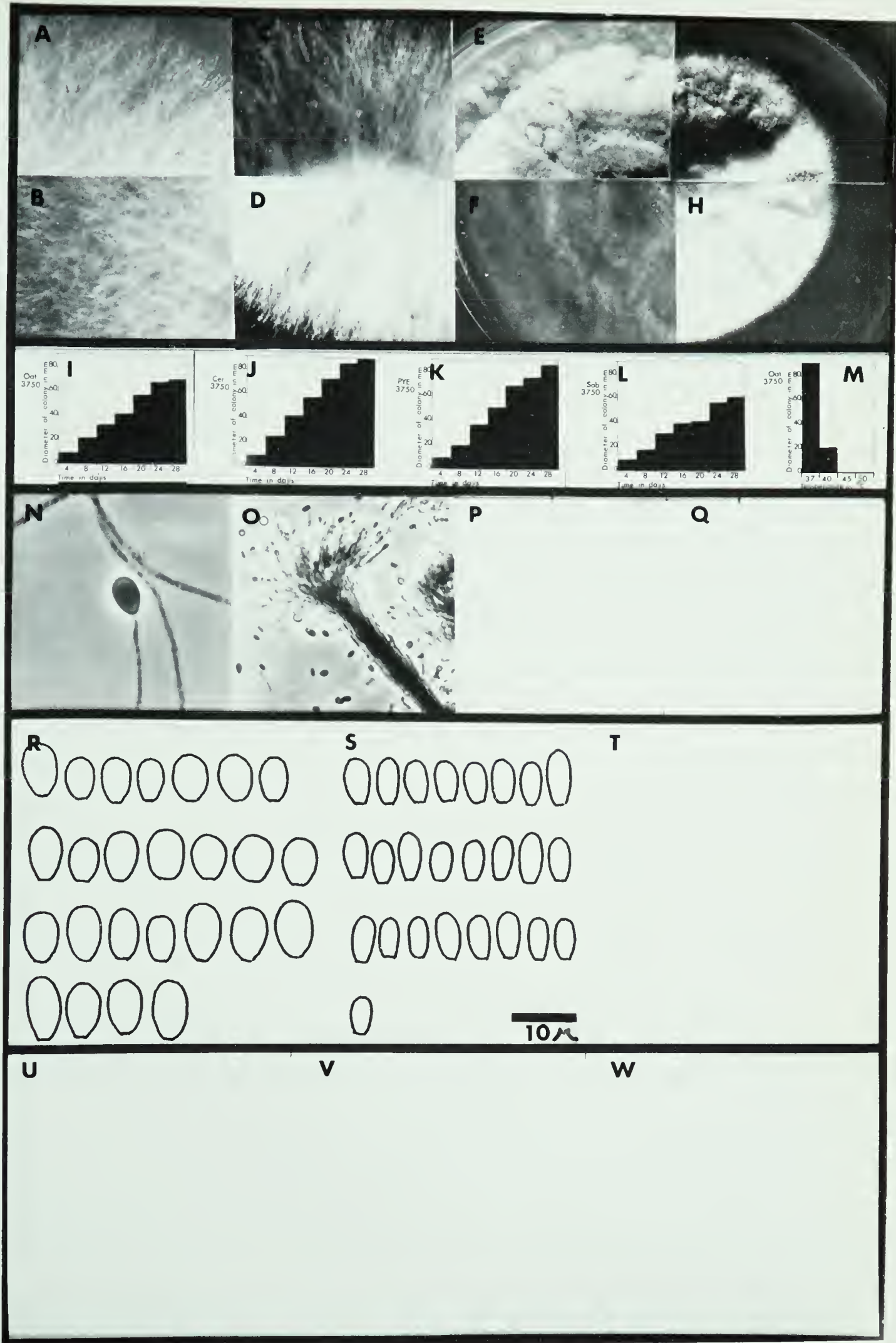


Plate #18: *Petriellidium boydii* UAMH 3872

Isolated from cattle manure, Lethbridge, 1975 by R. G. Bell

Received 1975 from Bell as *Petriellidium boydii* 1CF1

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown(dark mouse brown)/mod. dark
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Lt. mouse brown/yellow
 - 4) Sab- Off white/pale yellow green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-9 x 3.5-6 μ m Figs. N,R
- b. Synnemalous conidia- 4.5-7 x 2-3 μ m Figs. O,S
- c. Ascocarps- 88.5-135 μ m dia. Figs. P,U
- d. Ascospores- 6.5-8 x 3.5-5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* strain.

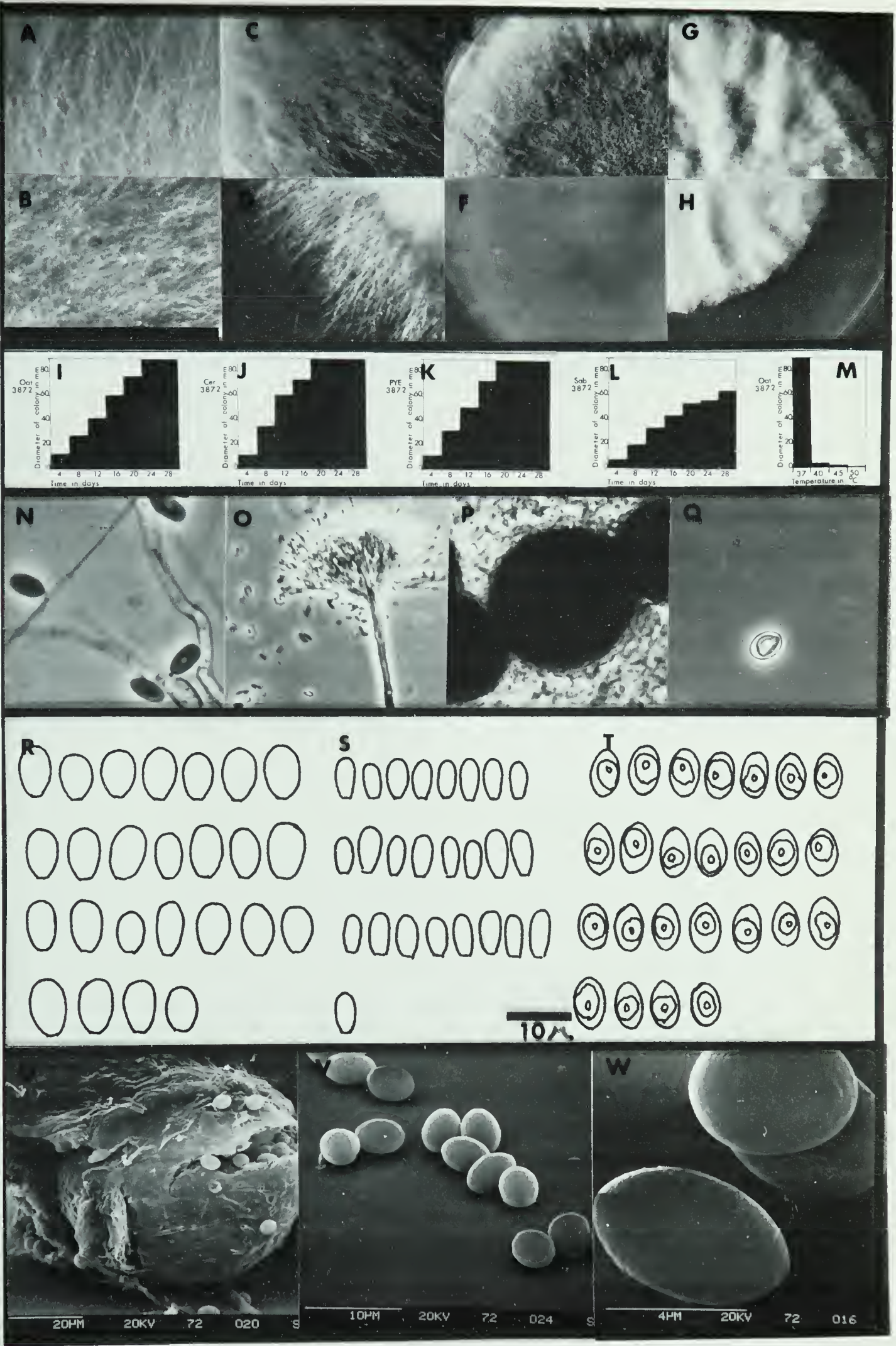




Plate #19: *Petriellidium boydii* UAMH 3873

Isolated from cattle manure, Lethbridge, 1975 by R. G. Bell

Received 1975 from Bell as *Petriellidium boydii* 36F1

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark mouse brown(dark green)/dark
 - 2) Cer- Dark mouse brown/greenish
 - 3) PYE- Dark mouse brown/dark orange green
 - 4) Sab- Mod. mouse brown/olive green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-9.5 x 3.5-5.5 μ m Figs. N,R
- b. Synnemalous conidia- 5.5-7 x 1.5-2 μ m Figs. O,S
- c. Ascocarps- 73-133 μ m dia. Figs. P,U
- d. Ascospores- 6-8 x 3.5-5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* strain.

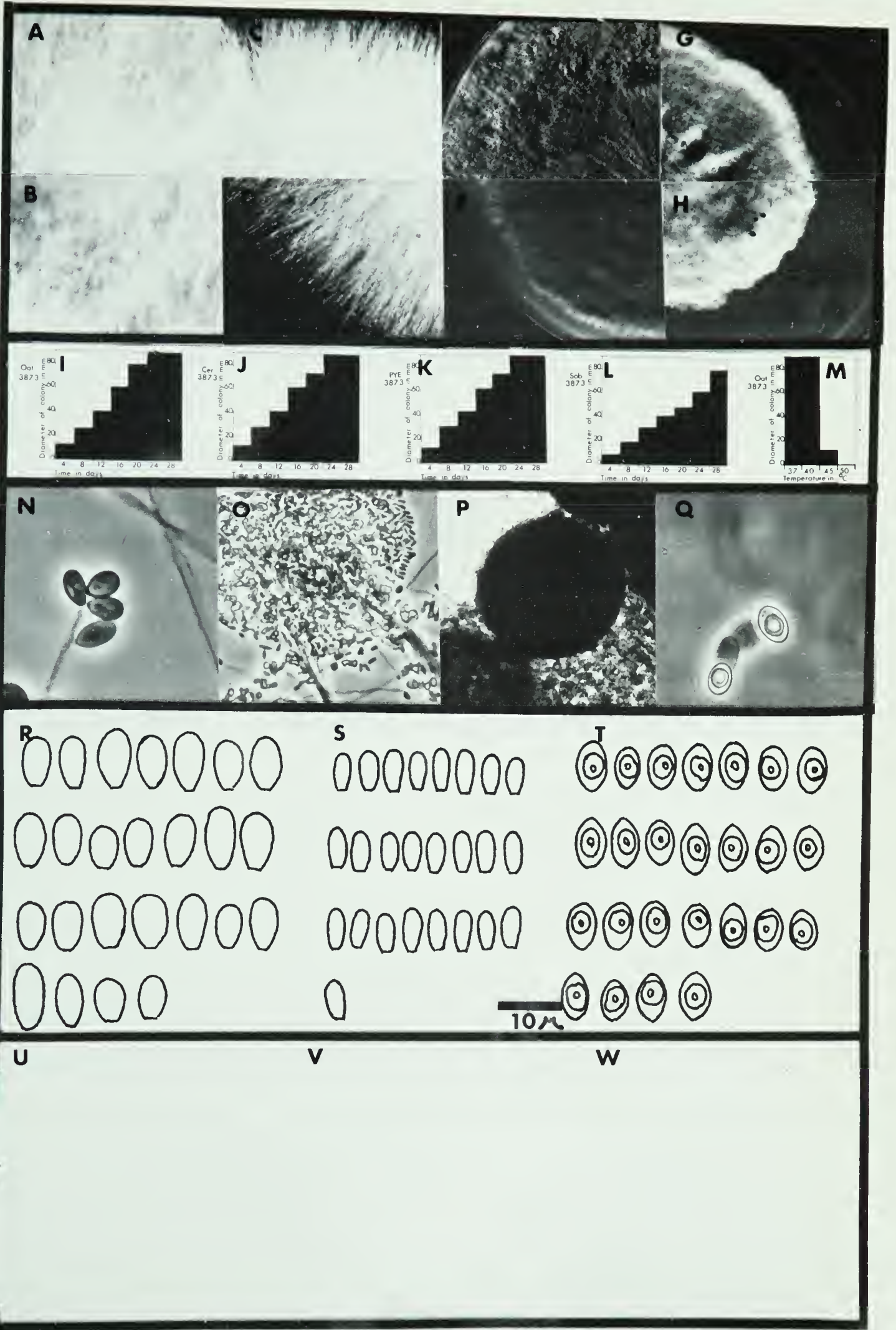




Plate #20: *Petriellidium boydii* UAMH 3904

Isolated from Fungus ball- autopsy human, Chicago, 1975
by J. W. Rippon

Received 1975, from Rippon as *Monosporium*?

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark mouse brown(lt. to mod. mouse brown)/dark
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Mod. mouse brown/yellow green
 - 4) Sab- Mod. mouse brown(lt. grey)/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-8.5 x 3.5-6 μ m Figs. N,R
- b. Synnematus conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

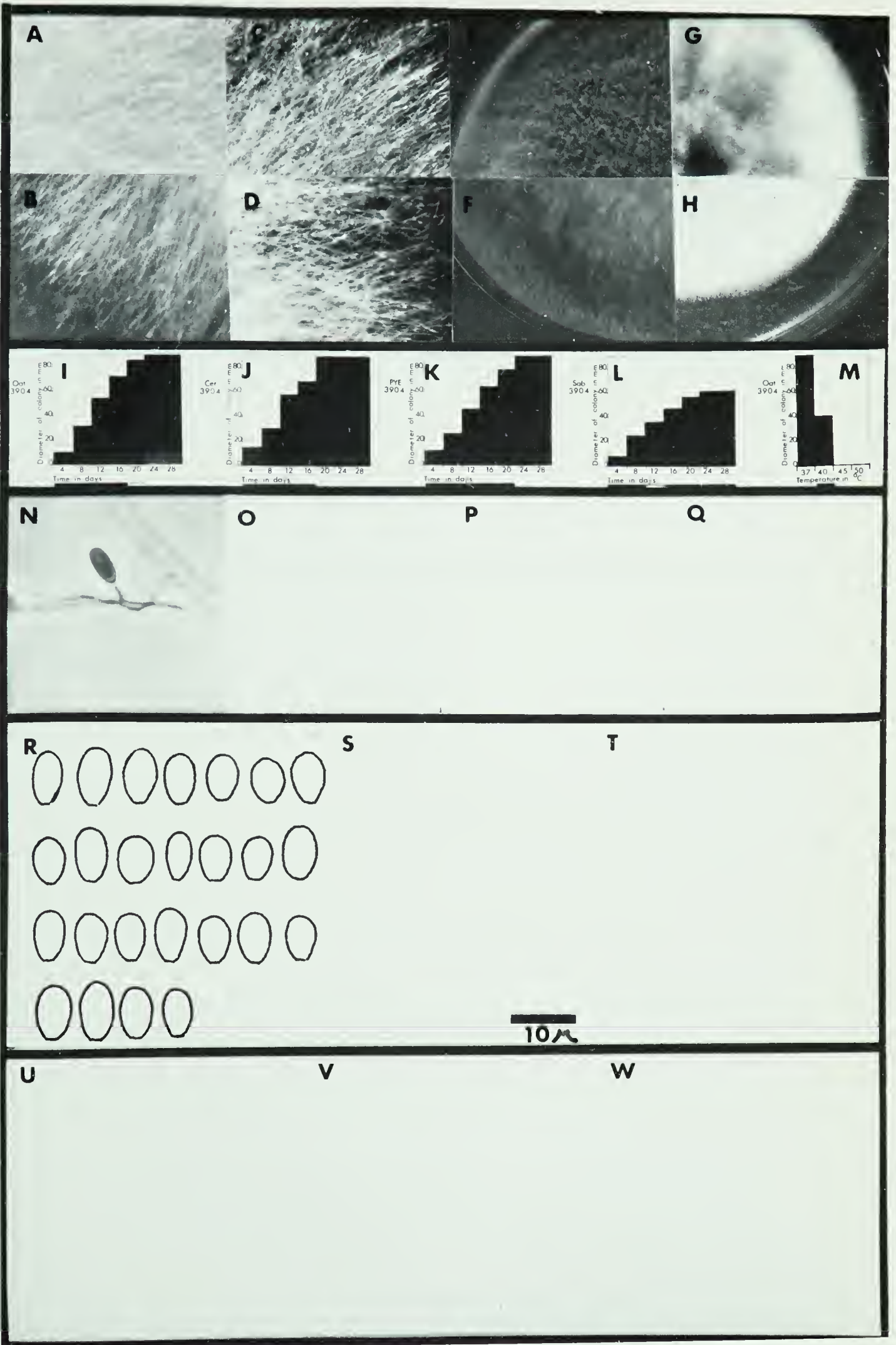




Plate #21: *Petriellidium boydii* UAMH 3905

Isolated from sputum, Chicago, 1975 by J. W. Rippon

Received 1975 from Rippon as *Monosporium*

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Deep grey-green/dark
 - 2) Cer- Mod. grey(dark grey)/none
 - 3) PYE- Lt. mouse brown/dark olive green
 - 4) Sab- Lt. grey/mod olive green(blue green)

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6.5-10 x 4-6 μ m Figs. N,R
- b. Synnemalous conidia- 9.5-22.5 x 2.5-6.5 μ m Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,V,W

4. Comments

The *Graphium* conidia are larger than normally seen in the other strains.

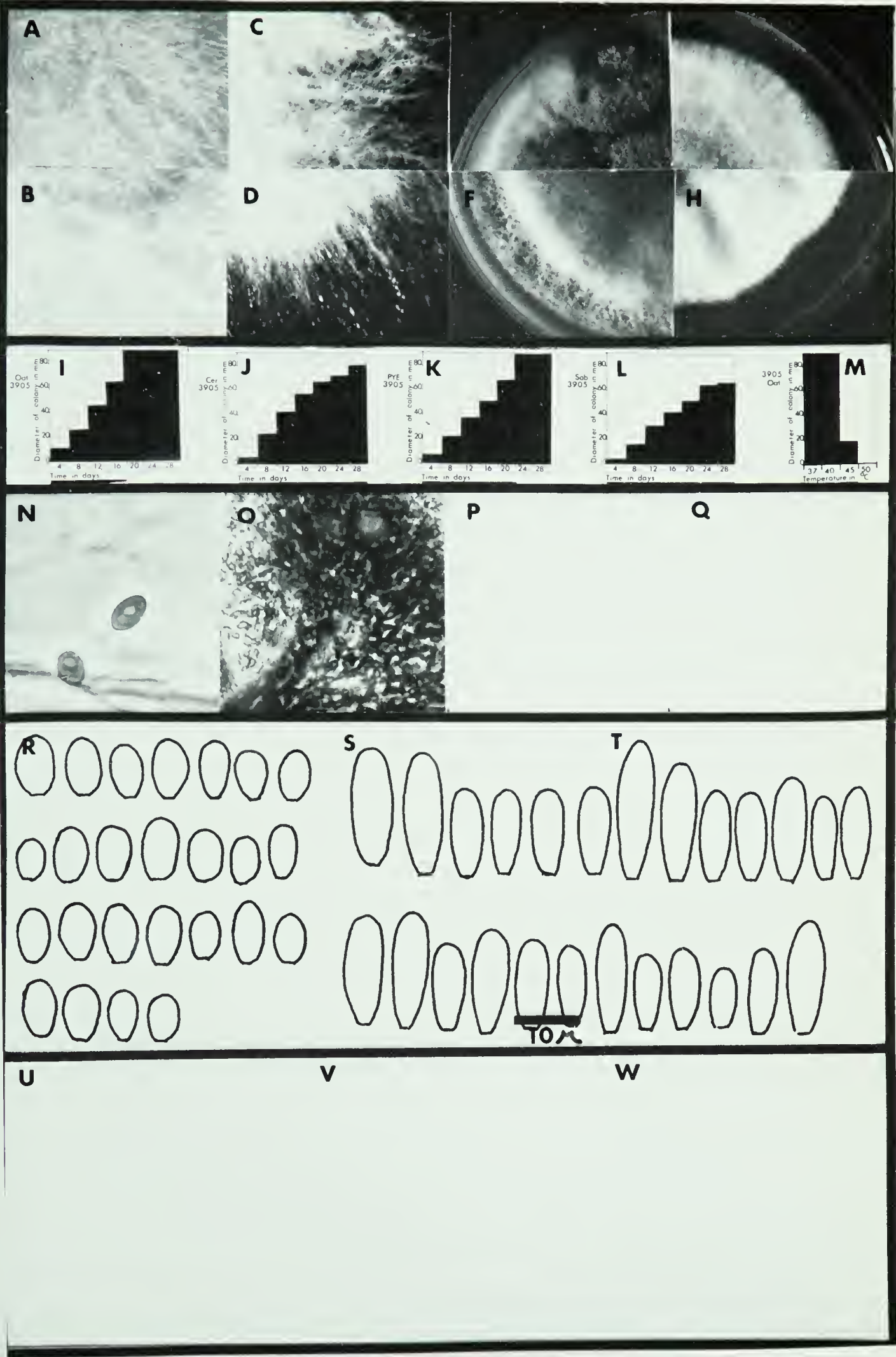


Plate #22: *Petriellidium boydii* UAMH 3973

Isolated from knee paramycetoma, Argentina, 1944 by
Fischer

Received 1976 from Negróni as *Pseudallescheria shearii*
Type strain 5163

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. mouse brown/mod.dark
 - 2) Cer- Lt. mouse brown-grey/none
 - 3) PYE- Lt. mouse brown/yellow green
 - 4) Sab- Lt. grey/cream pale yellow green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-9 x 3.5-5.5 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is the type strain of *Pseudallescheria shearii*. It is a typical *P. boydii* anamorph.

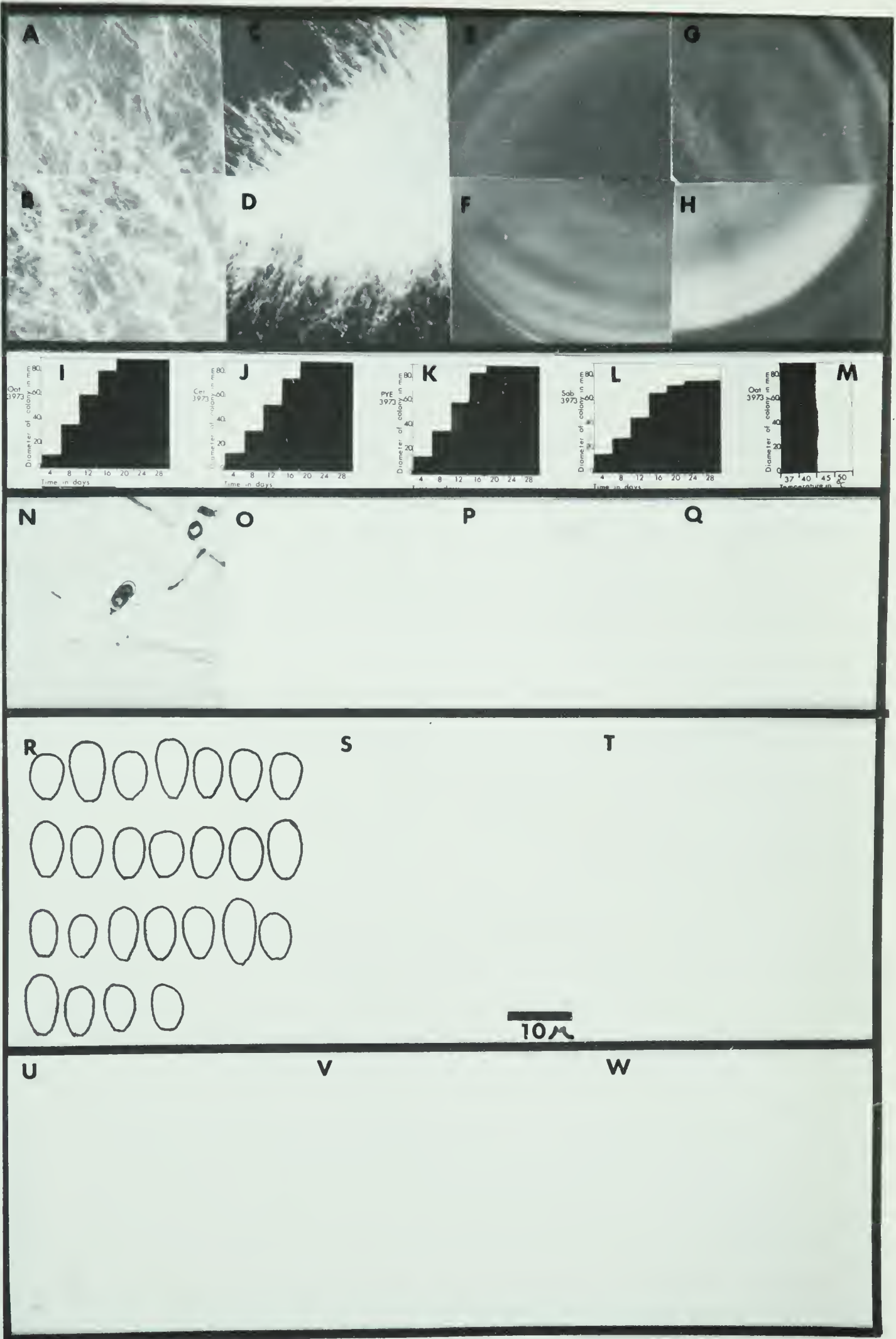




Plate #23: *Petriellidium boydii* UAMH 3981

Isolated from man

Received 1976 from CBS as *Petriellidium boydii* CBS

316.54

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. silver grey/dark
 - 2) Cer- Mod. grey/none
 - 3) PYE- Mod. mouse brown-grey/dark olive green
 - 4) Sab- Mod. mouse brown/deep blue green(dark brown)

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 7-10 x 4-6.5 μ m Figs. N,R
- b. Synnematos conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

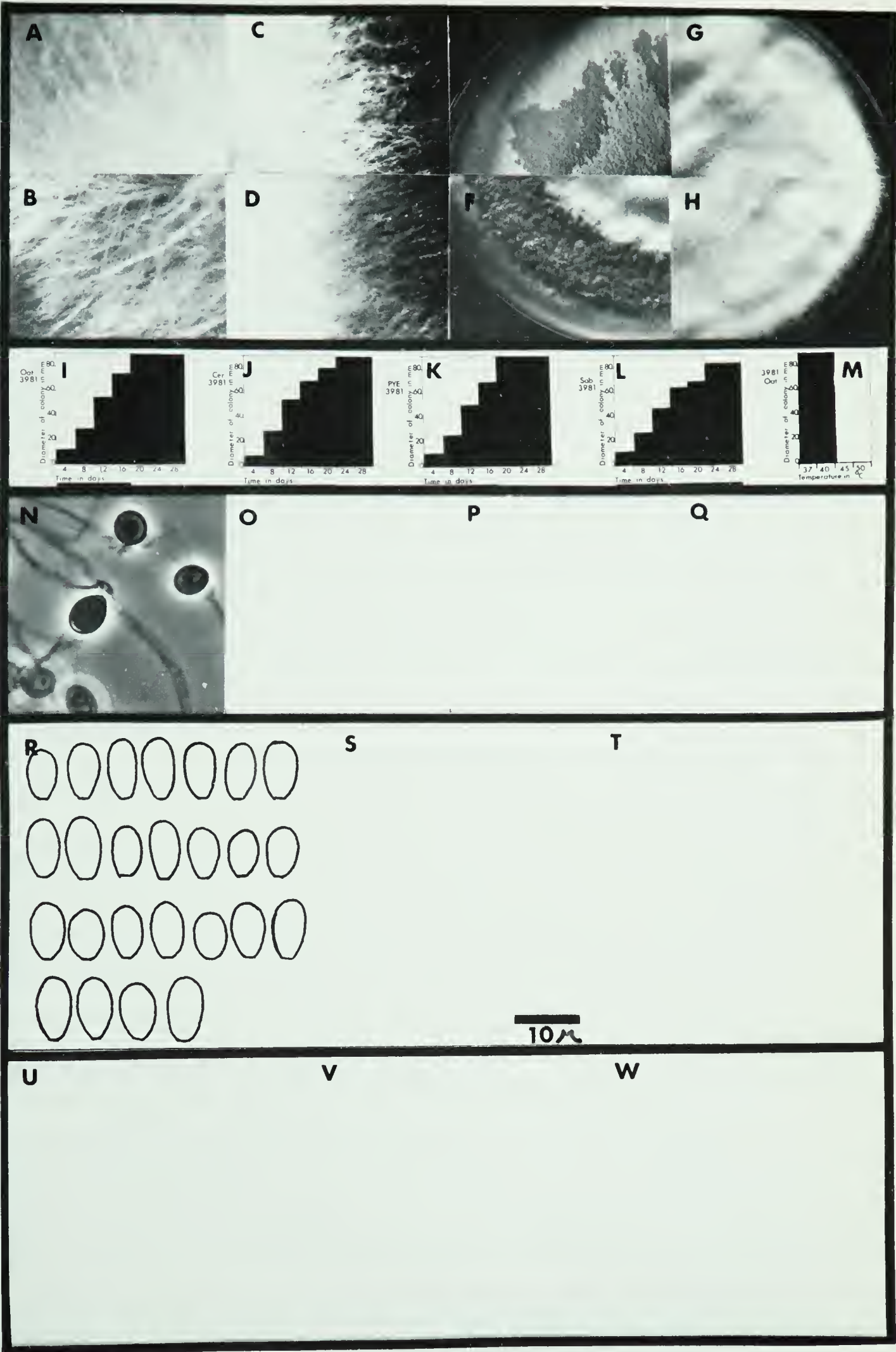




Plate #24: *Petriellidium boydii* UAMH 3982

Isolated from mycetoma, Texas, 1921 by C. L. Shear

Received 1976 from CBS as *Petriellidium boydii* Type CBS

101.22

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. mouse brown(lt. grey)/light(mod. dark)
 - 2) Cer- Mod. mouse brown(mod. grey)/none
 - 3) PYE- Lt. mouse brown-flesh/yellow
 - 4) Sab- Lt. silver/cream(yellow)

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-10 x 3.5-6 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

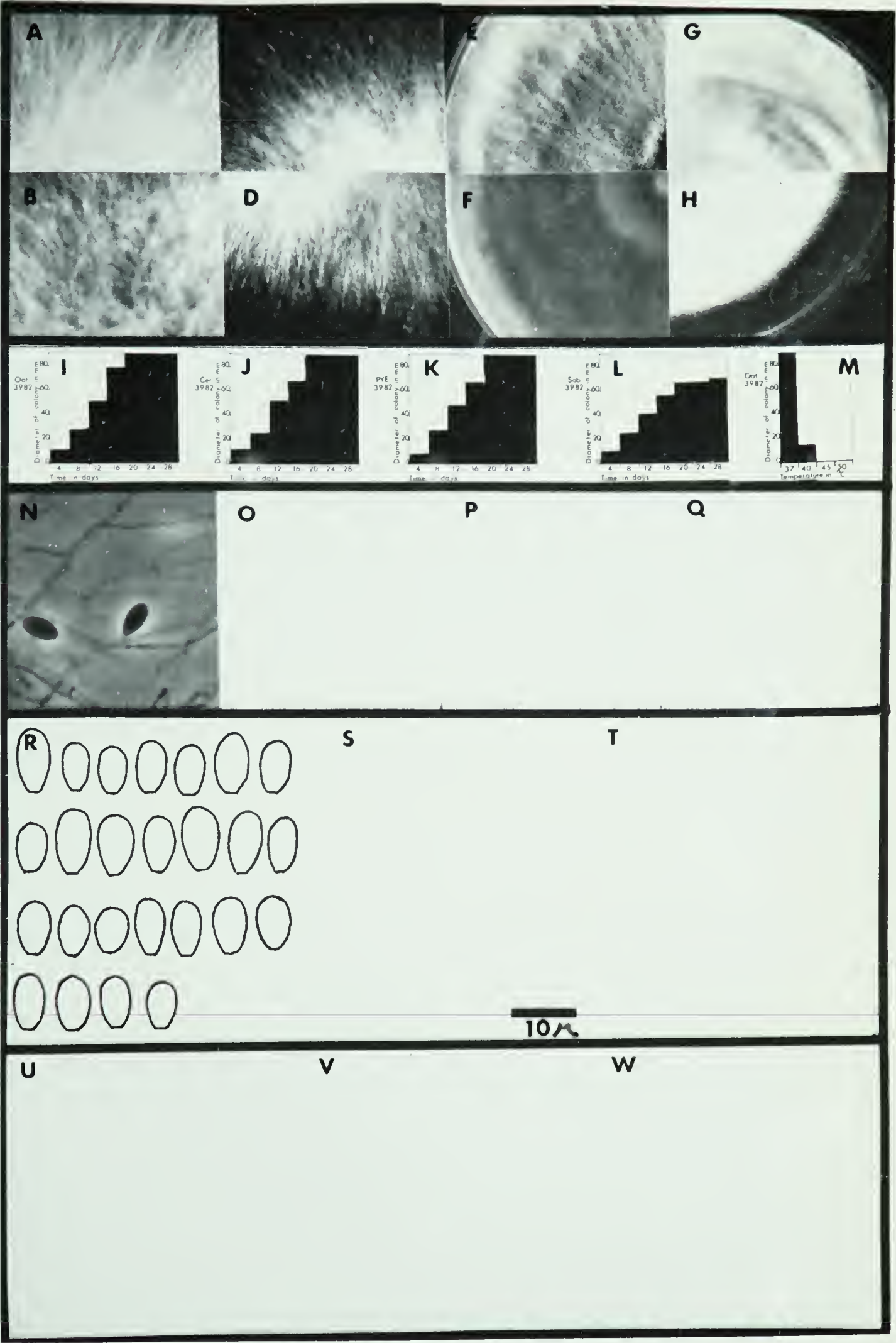


Plate #25: *Petriellidium boydii* UAMH 3987

Isolated from soil, Tadzhikistan, 1973 by O. Fassatiova

Received 1976 from CBS as *Petriellidium ellipsoideum*

Type CBS 418.73

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark olive green/dark
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Off white/yellow(pie shaped dark area)
 - 4) Sab- Off white/cream yellow

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-9 x 3-5.5 μ m Figs. N,R
- b. Synnemalous conidia- 5.5-9 x 2-3.5 μ m Figs. O,S
- c. Ascocarps- 73-128.5 μ m dia. Figs. P,U
- d. Ascospores- 6.5-8 x 3.5-5 μ m, golden Figs. Q,T,V,W

4. Comments

This is the type strain of *P. ellipsoideum*. It is a typical *P. boydii* strain.

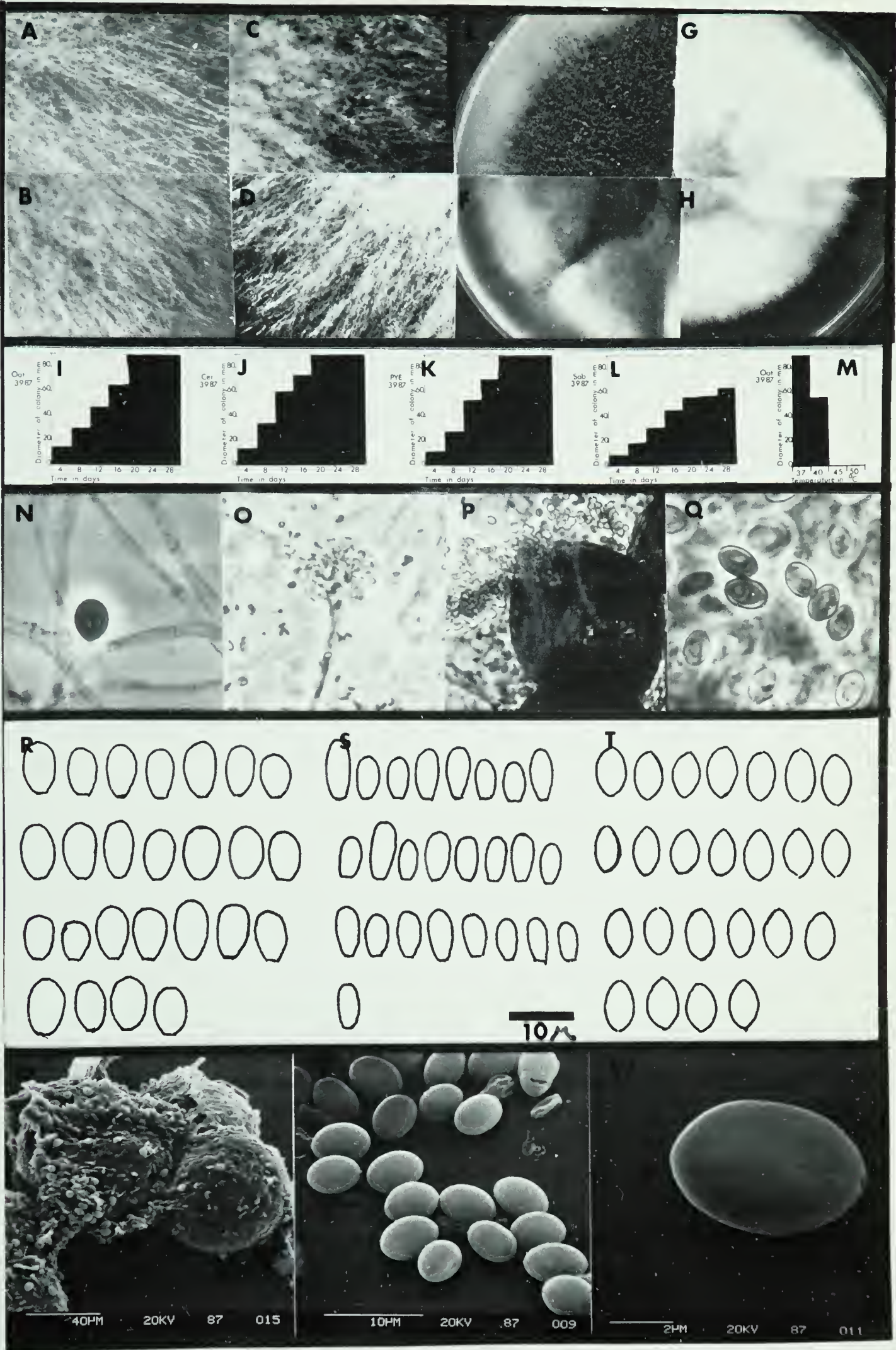




Plate #26: *Petriellidium boydii* UAMH 3990

Isolated from nasal cavity of swine, by A. A. Milko

Received 1976 from CBS as *Petriellidium boydii* CBS

695.70

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown(silver grey)/mod. dark
 - 2) Cer- Lt. grey to tan/none
 - 3) PYE- Off white/yellow
 - 4) Sab- Off white/pale yellow green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-9 x 4-6 μ m Figs. N,R
- b. Synnemalous conidia- 6-9 x 2-3.5 μ m Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is the type strain of *Acremonium suis*. It is a typical *P. boydii* anamorph.

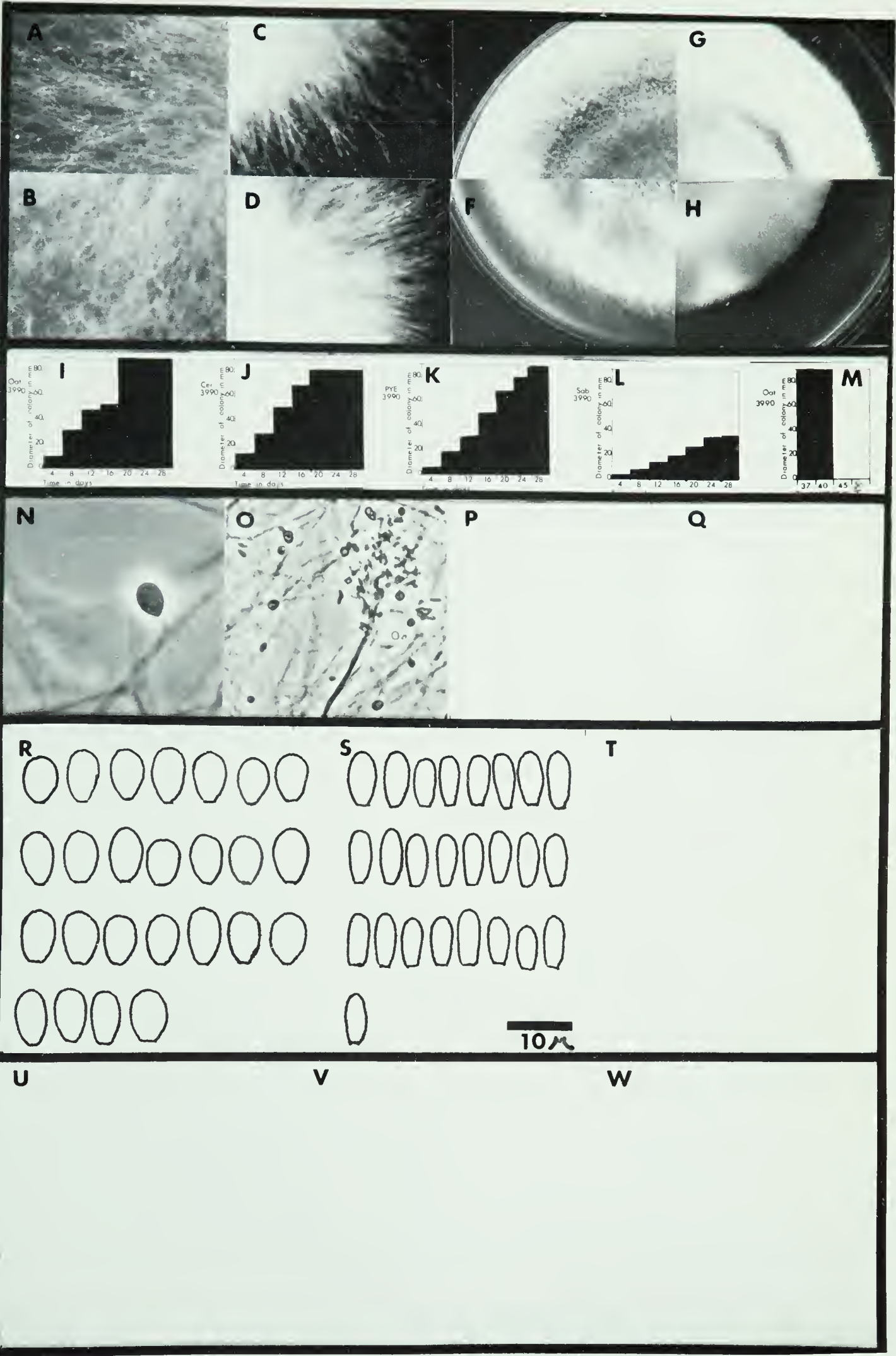




Plate #27: *Petriellidium boydii* UAMH 3991

Isolated from soil by D. Mucke

Received 1976 from CBS as *Petriellidium boydii* CBS

114.59

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Off white/light(mod. dark)
 - 2) Cer- Mod. grey/none
 - 3) PYE- Lt. mouse brown//mod. olive green
 - 4) Sab- Off white/pale cream green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-8.5 x 3.5-5.5 μ m Figs. N,R
- b. Synnematos conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

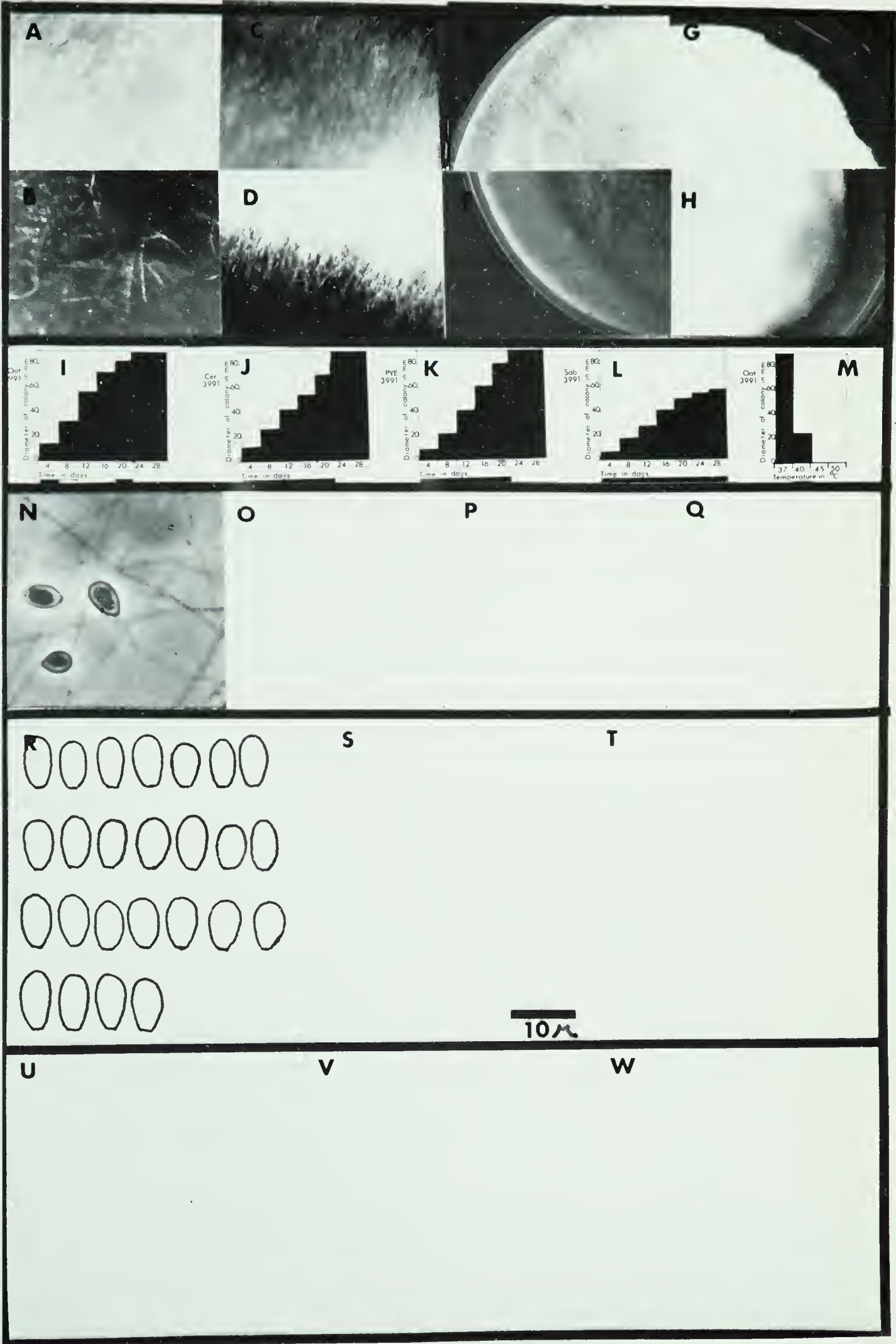




Plate #28: *Petriellidium boydii* UAMH 3995

Isolated from Savannah soil, Africa, by J. L. Renard

Received 1976 from CBS as *Petriellidium boydii* CBS

254.66

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Off white/light
 - 2) Cer- Off white/none
 - 3) PYE- Off white/yellow-gold
 - 4) Sab- Off white/yellow

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5-8 x 2.5-4.5 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

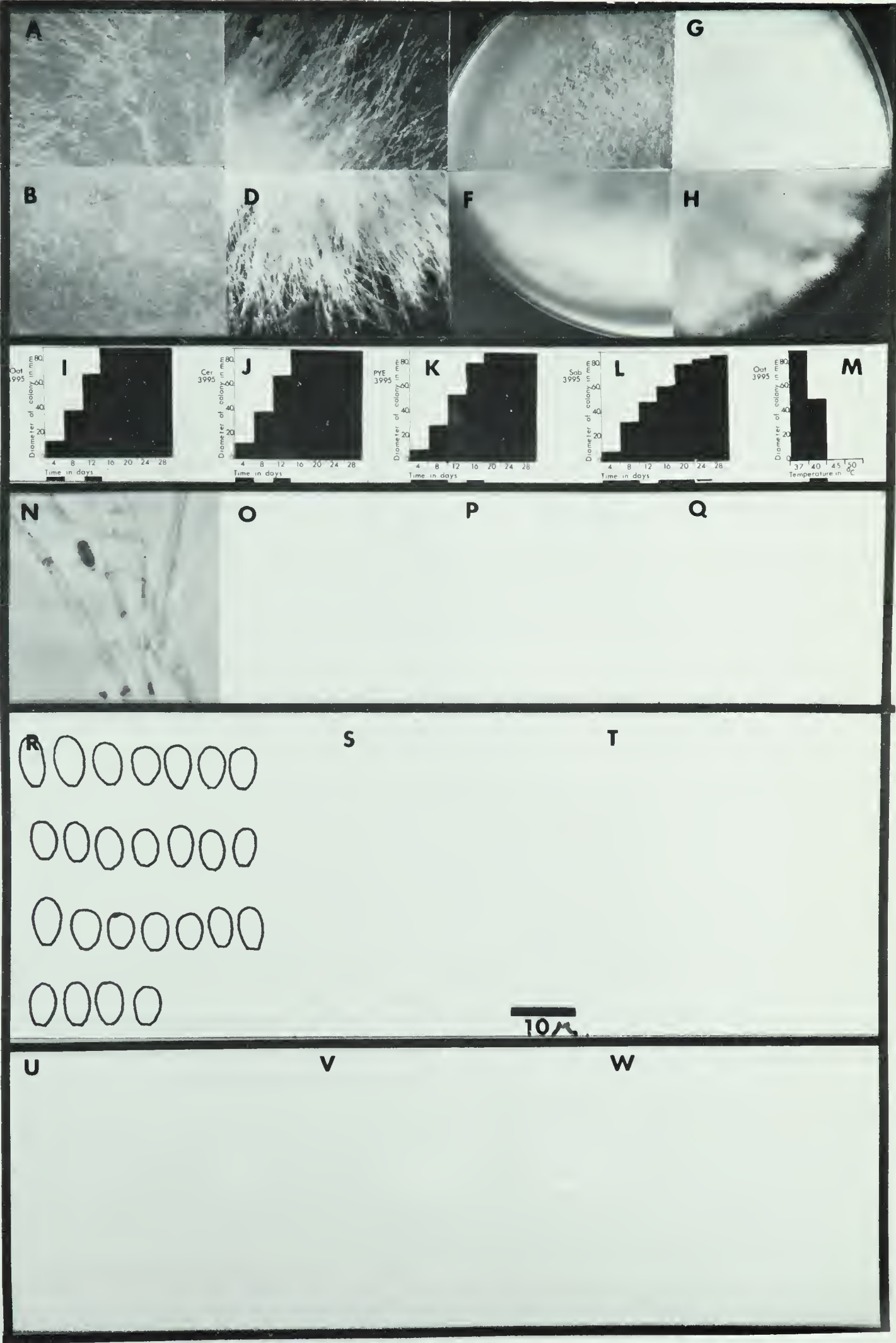




Plate #29: *Petriellidium boydii* UAMH 4218

Isolated from eye and chest wall biopsy, Chicago, 1979
by J. Rippon

Received 1979 from Rippon as *Petriellidium boydii*

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown(dark olive green)/dark
 - 2) Cer- Mod. mouse brown/none
 - 3) PYE- Mod. mouse brown/yellow green
 - 4) Sab- Lt. mouse brown(mod. grey)/pale olive green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5-8 x 3.5-5.5 μ m Figs. N,R
- b. Synnematus conidia- 4.5-7 x 2-3.5 μ m Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

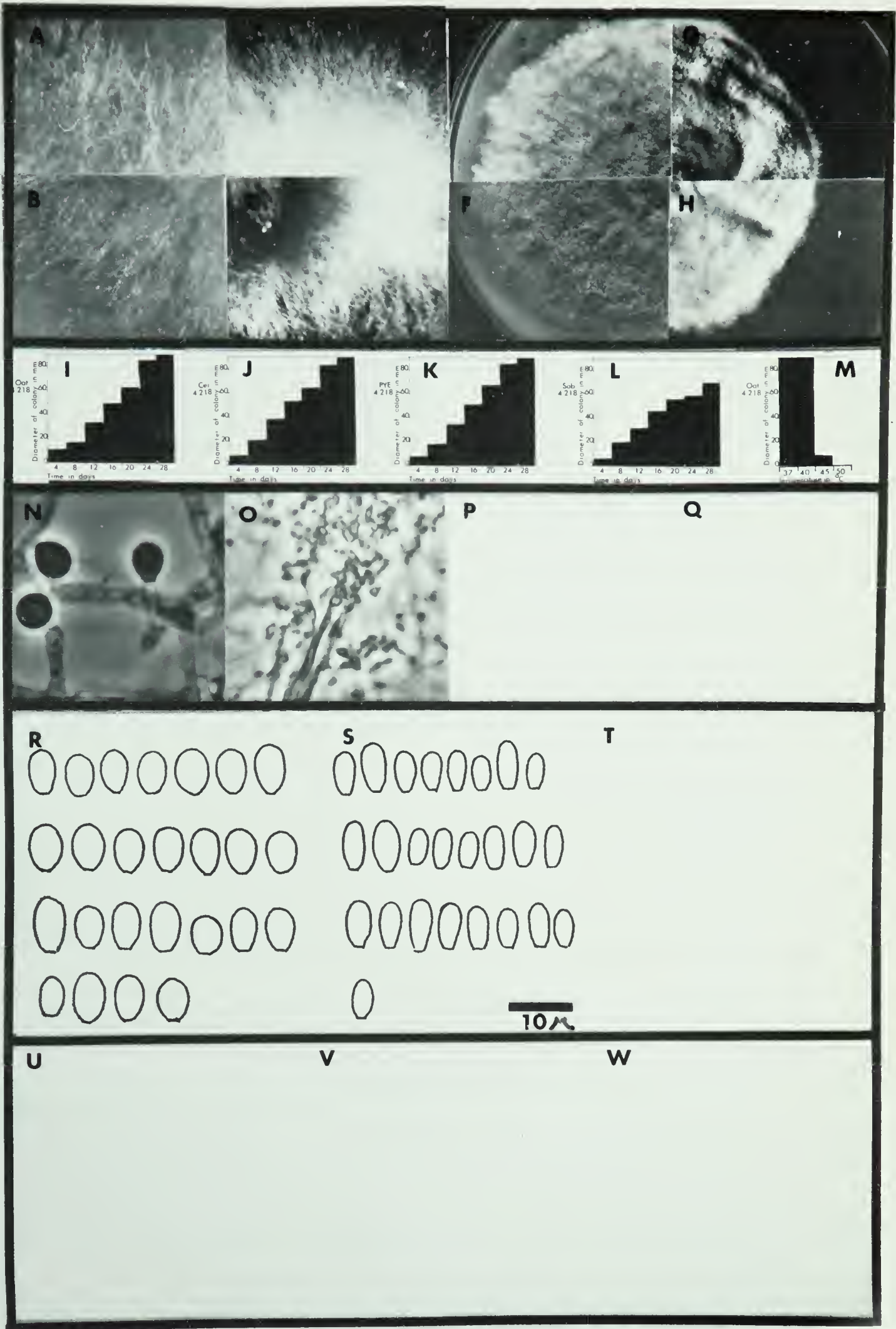


Plate #30: *Petriellidium boydii* UAMH 4238

Isolated from immunosuppressed patient at autopsy,
UCLA, 1979 by D. Howard

Received 1979 from Howard as *Petriellidium boydii* 8375

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark olive green/dark
 - 2) Cer- Mod. mouse brown/none
 - 3) PYE- Dark olive green/dark olive green
 - 4) Sab- Mod. olive green/dark olive green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-9 x 3.5-5.5 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

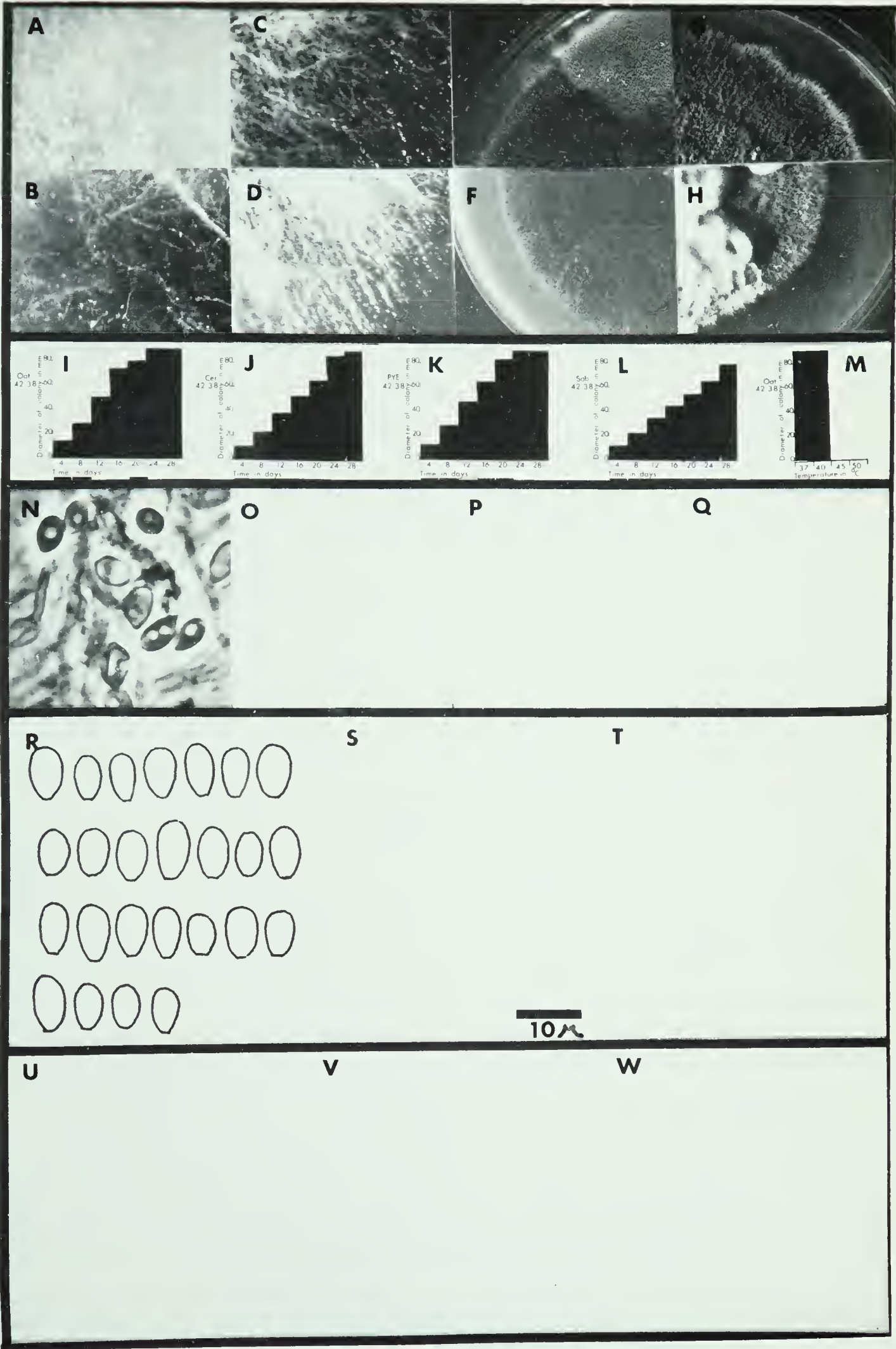




Plate #31: *Petriellidium boydii* UAMH 4248

Isolated from widespread disseminated disease, UCLA, by
D. Howard

Received 1979 from Howard as *Scedosporium* species 3382

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark olive green/dark
 - 2) Cer- Dark mouse brown/none
 - 3) PYE- Lt. mouse brown over dark olive green/dark
olive green
 - 4) Sab- Dark olive green/dark olive green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-9 x 3.5-5.5 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

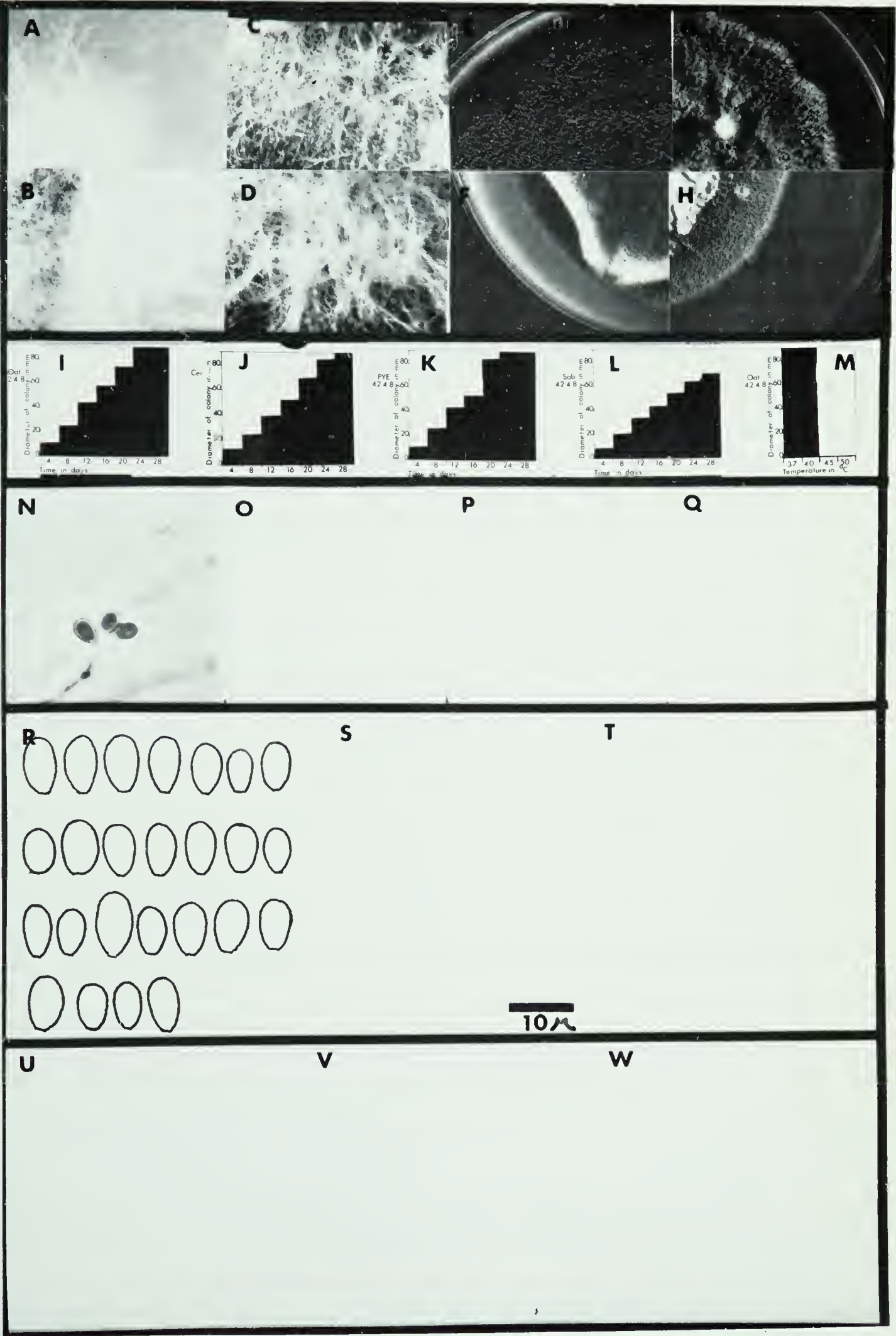


Plate #32: *Petriellidium boydii* UAMH 4301

Isolated from sputum, Ontario, 1980 by J. Kane

Received 1980 from Kane as *Petriellidium boydii* OMH 1

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. mouse brown/light
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Off white/gold
 - 4) Sab- Off white/pale yellow gold

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-8.5 x 3-5 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

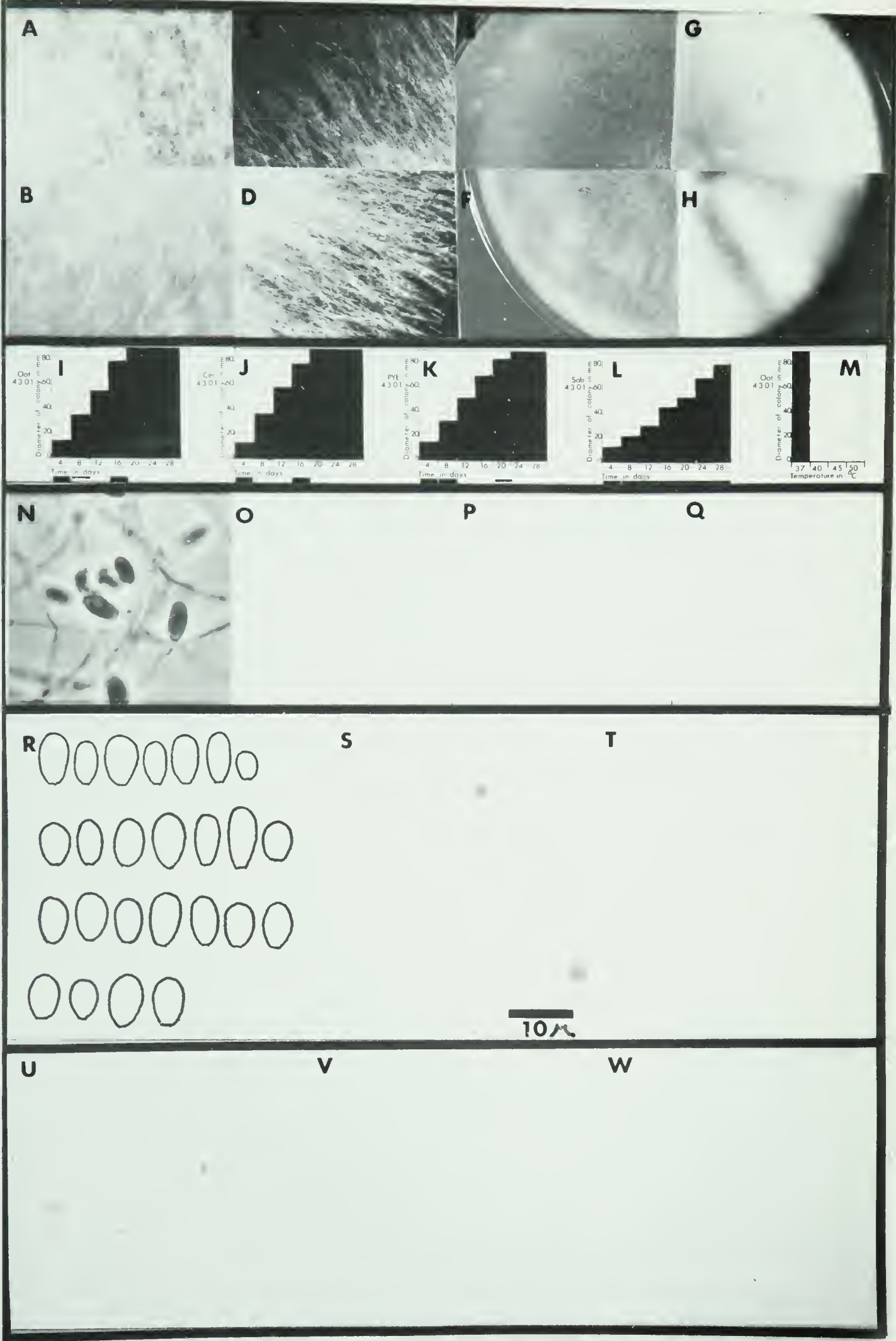


Plate #33: *Petriellidium boydii* UAMH 4302

Isolated from sputum, Ontario, 1980 by J. Kane

Received 1980 from Kane as *Petriellidium boydii* OMH

1159

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown/dark
 - 2) Cer- Dark mouse brown/none
 - 3) PYE- Mod. mouse brown/yellow green
 - 4) Sab- Lt. mouse brown/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-8 x 3-5 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- 66.5-107 μ m dia. Figs. P,U
- d. Ascospores- 6-7.5 x 4-5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* strain.

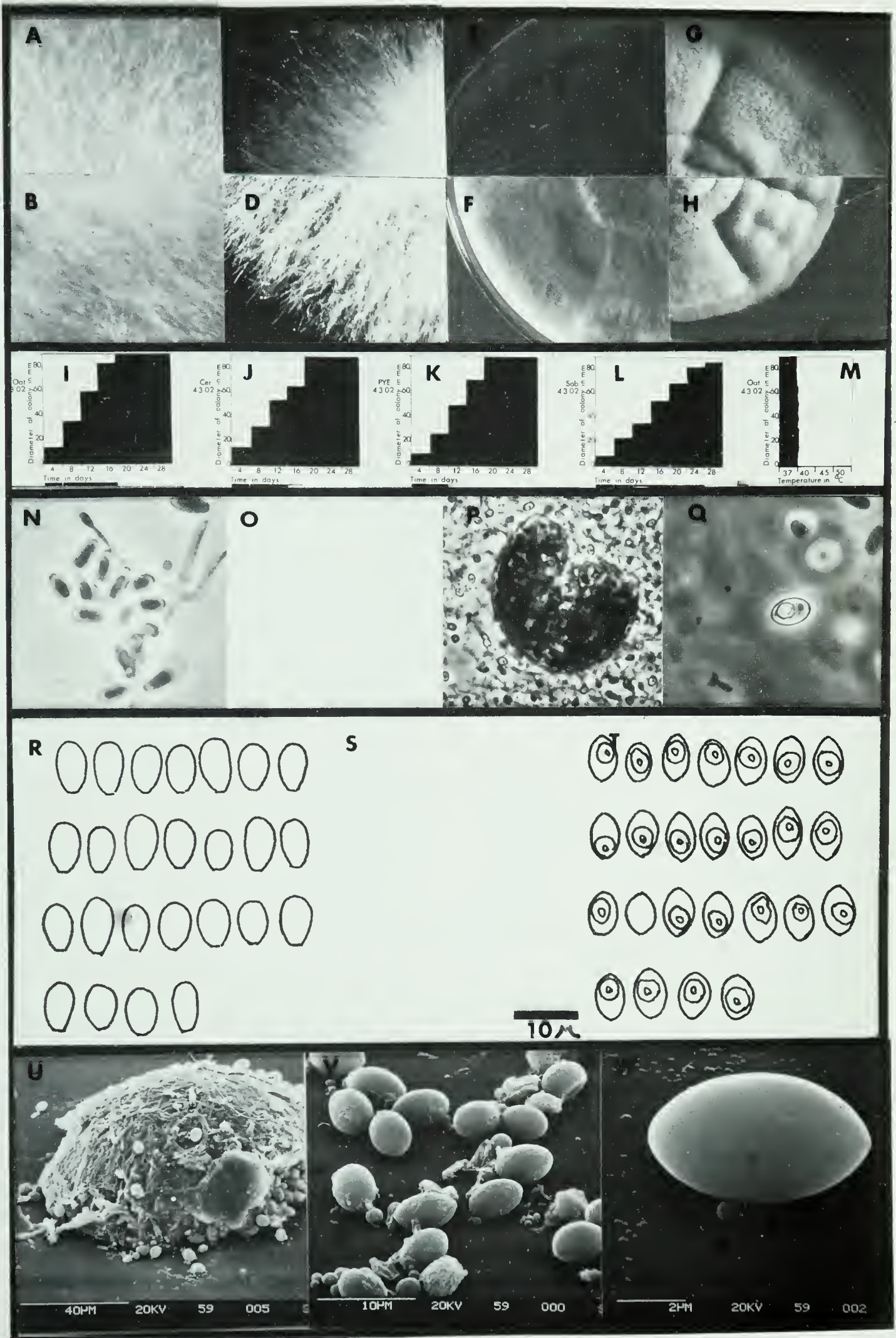


Plate #34: *Petriellidium boydii* UAMH 4303

Isolated from sputum, Ontario, 1980 by J. Kane

Received 1980 from Kane as *Petriellidium boydii* Fr 676

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark mouse brown/dark
 - 2) Cer- Mod. mouse brown/none
 - 3) PYE- Mod. mouse brown(dark mouse brown)/dark
yellow green
 - 4) Sab- Lt. mouse brown/pale yellow green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-8.5 x 3.5-5.5 μ m Figs. N,R
- b. Synnematos conidia- 4-8 x 2-3.5 μ m Figs. O,S
- c. Ascocarps- 101.5-155.5 μ m dia. Figs. P,U
- d. Ascospores- 6-8 x 4-5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* strain. The photographs illustrating colonial growth on Sab. at 4 and 21 days were not available.

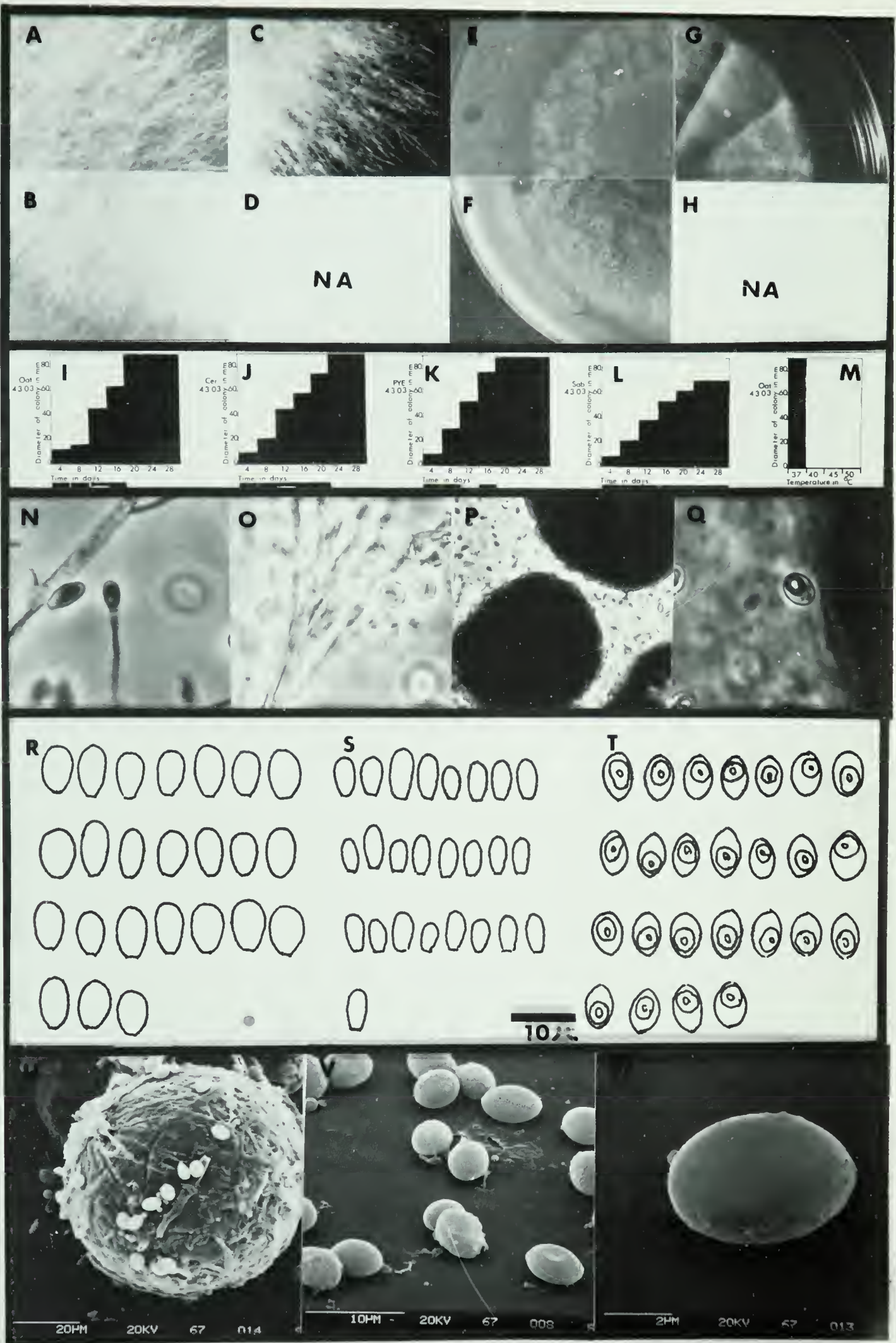


Plate #35: *Petriellidium boydii* UAMH 4304

Isolated from sputum, Ontario, 1980 by J. Kane

Received 1980 from Kane as *Petriellidium boydii* Fr 642

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown/dark
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Mod mouse brown-grey/yellow tan(cream green)
 - 4) Sab- Lt. grey-green/pale green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-8.5 x 3-5 μ m Figs. N,R
- b. Synnemalous conidia- 6-11.5 x 2-3.5 μ m Figs. O,S
- c. Ascocarps- 92.5-140 μ m dia. Figs. P,U
- d. Ascospores- 7-8.5 x 4.5-5.5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* strain.

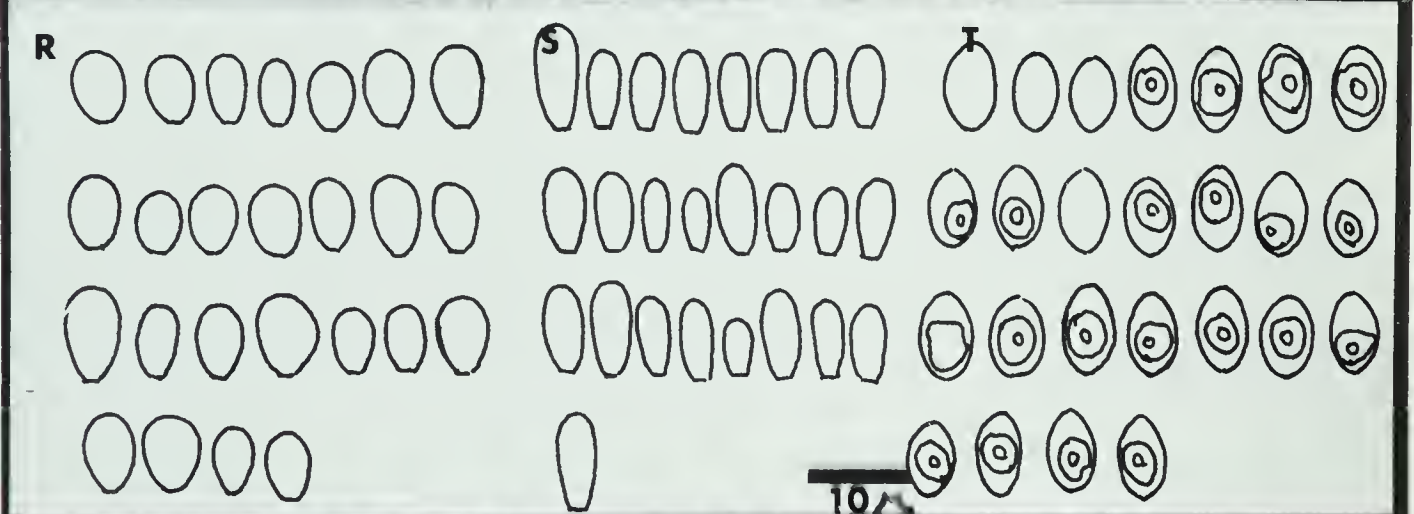
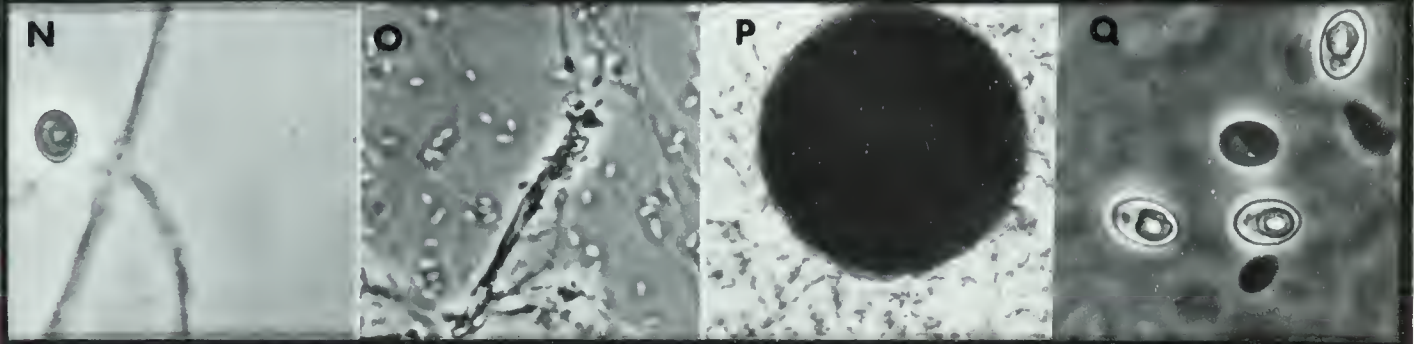
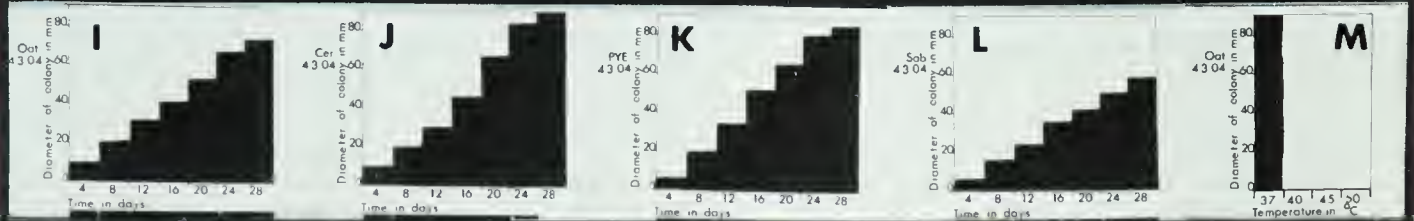
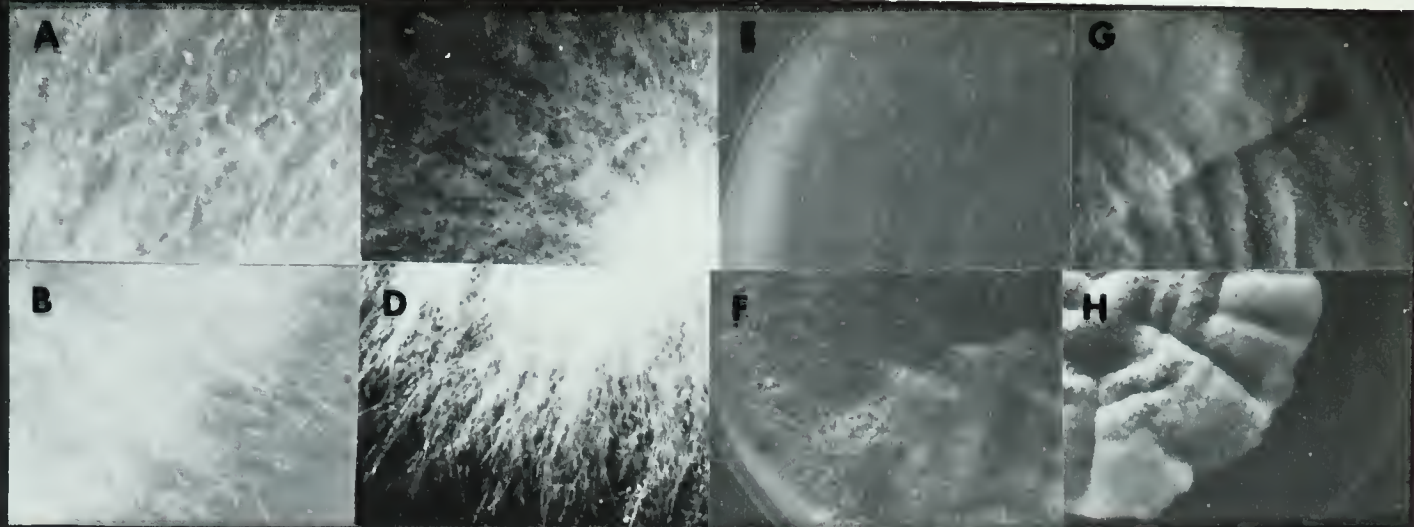




Plate #36: *Petriellidium boydii* UAMH 4310

Isolated from ear sample, Ontario, 1980 by J. Kane

Received 1980 from Kane as *Petriellidium boydii* Fr 806

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark mouse brown/dark
 - 2) Cer- Dark mouse brown/none
 - 3) PYE- Dark mouse brown-grey/yellow green
 - 4) Sab- Lt. mouse brown/gold

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-8 x 3-5.5 μ m Figs. N,R
- b. Synnemalous conidia- 5.5-9 x 2-3.5 μ m Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph. An abundant production of synnemata was observed.

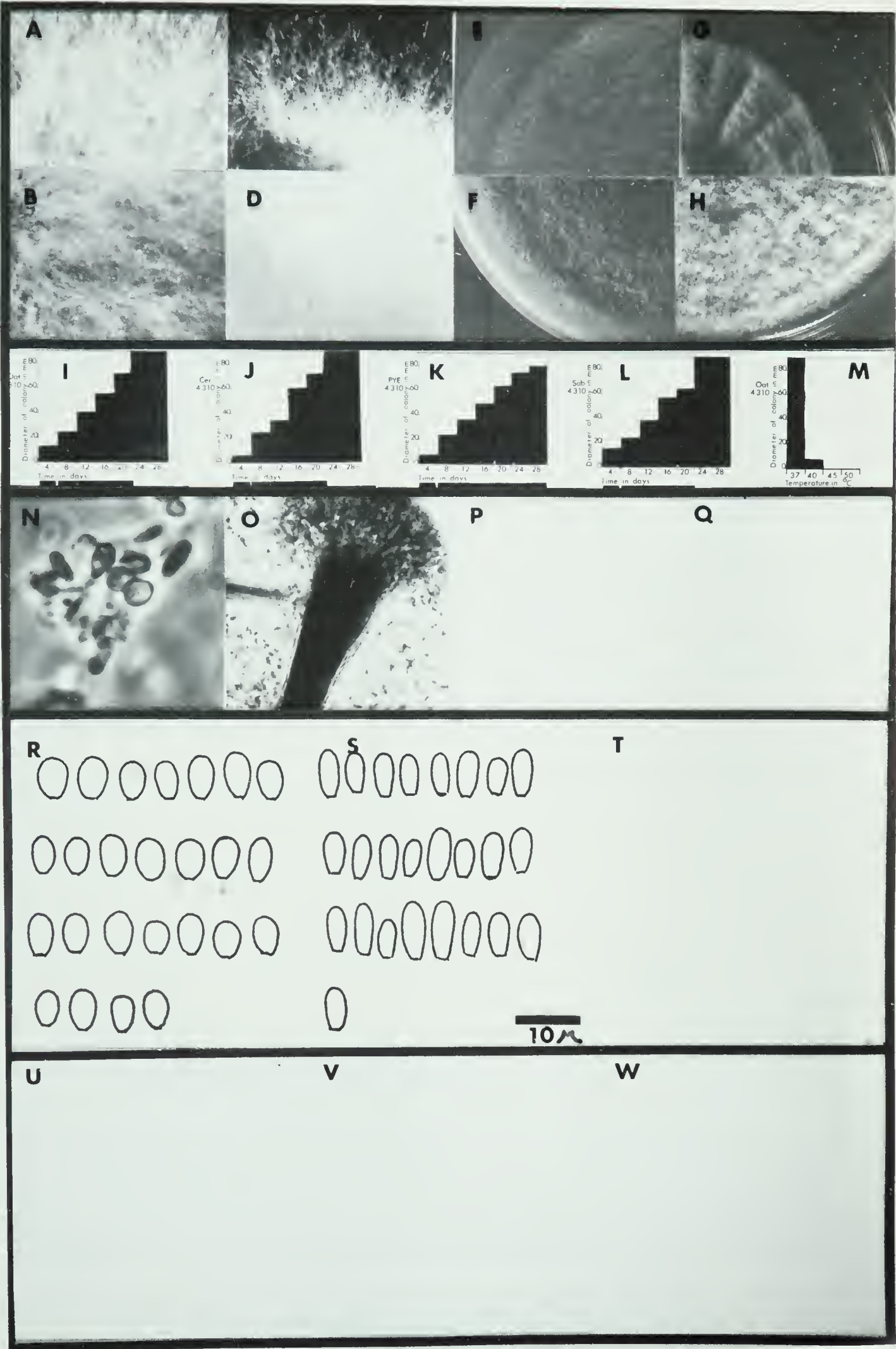


Plate #37: *Petriellidium boydii* UAMH 4408

Isolated from pasture soil, Alberta, 1980 by V. Mann

Entered 1980 as *Petriellidium boydii* S21F

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. mouse brown-grey/mod.dark
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Lt. mouse brown/gold
 - 4) Sab- Lt. mouse brown-grey/pale green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-7.5 x 3.5-5 μ m Figs. N,R
- b. Synnemalous conidia- 3-7.5 x 1.5-2.5 μ m Figs. O,S
- c. Ascocarps- 133.5-182 μ m dia. Figs. P,U
- d. Ascospores- 7.5-8.5 x 4.5-5 μ m, golden Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* strain.

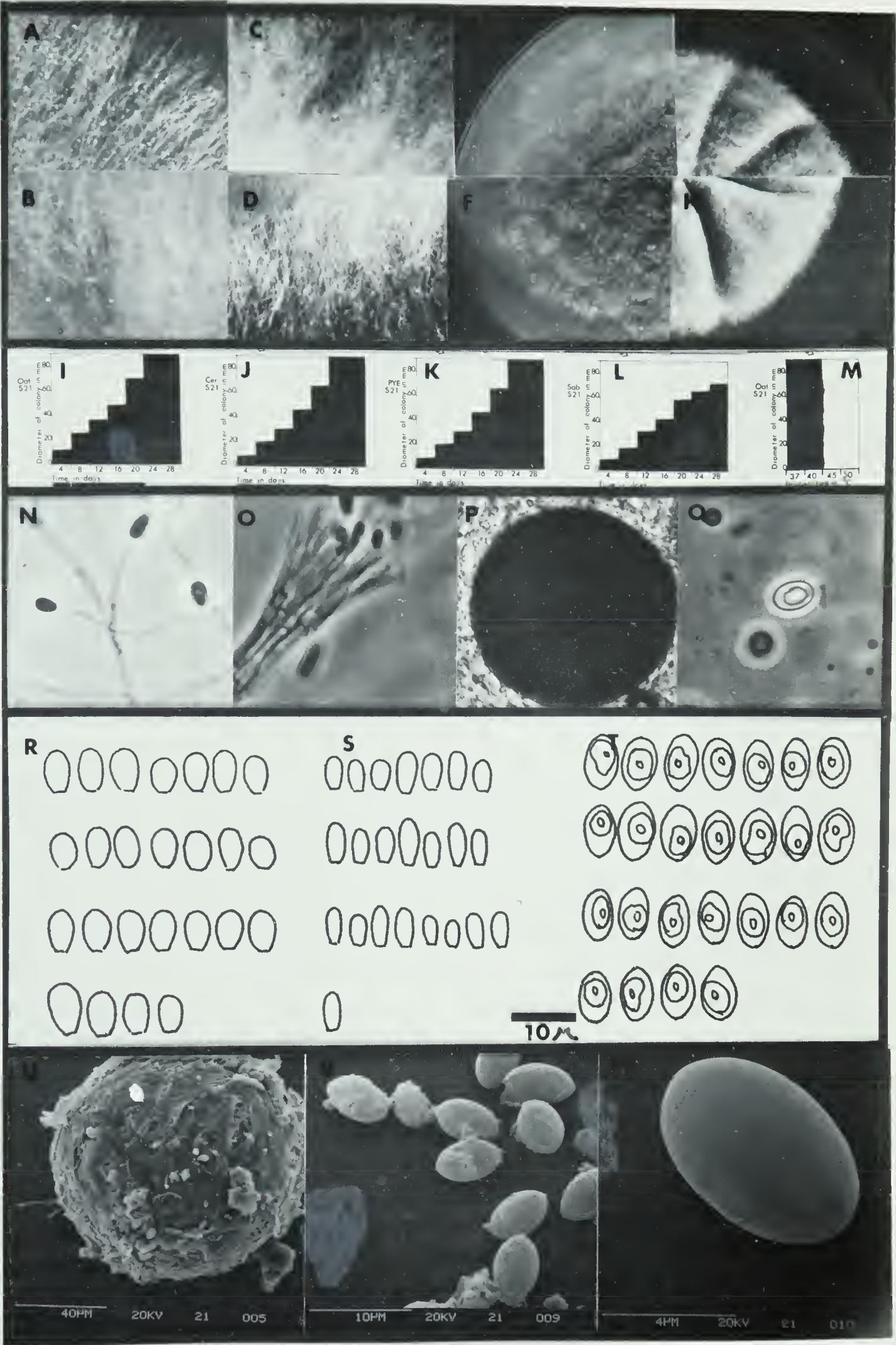




Plate #38: *Petriellidium boydii* UAMH 4409

Isolated from pasture soil, Alberta, 1980 by V. Mann

Entered 1980 as *Petriellidium boydii* S22DH

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. mouse brown/mod. dark
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Lt. mouse brown/yellow gold
 - 4) Sab- Lt. mouse brown/pale lt. green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5-7.5 x 3-5 μ m Figs. N,R
- b. Synnemalous conidia- 4-7.5 x 1.5-3.5 μ m Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

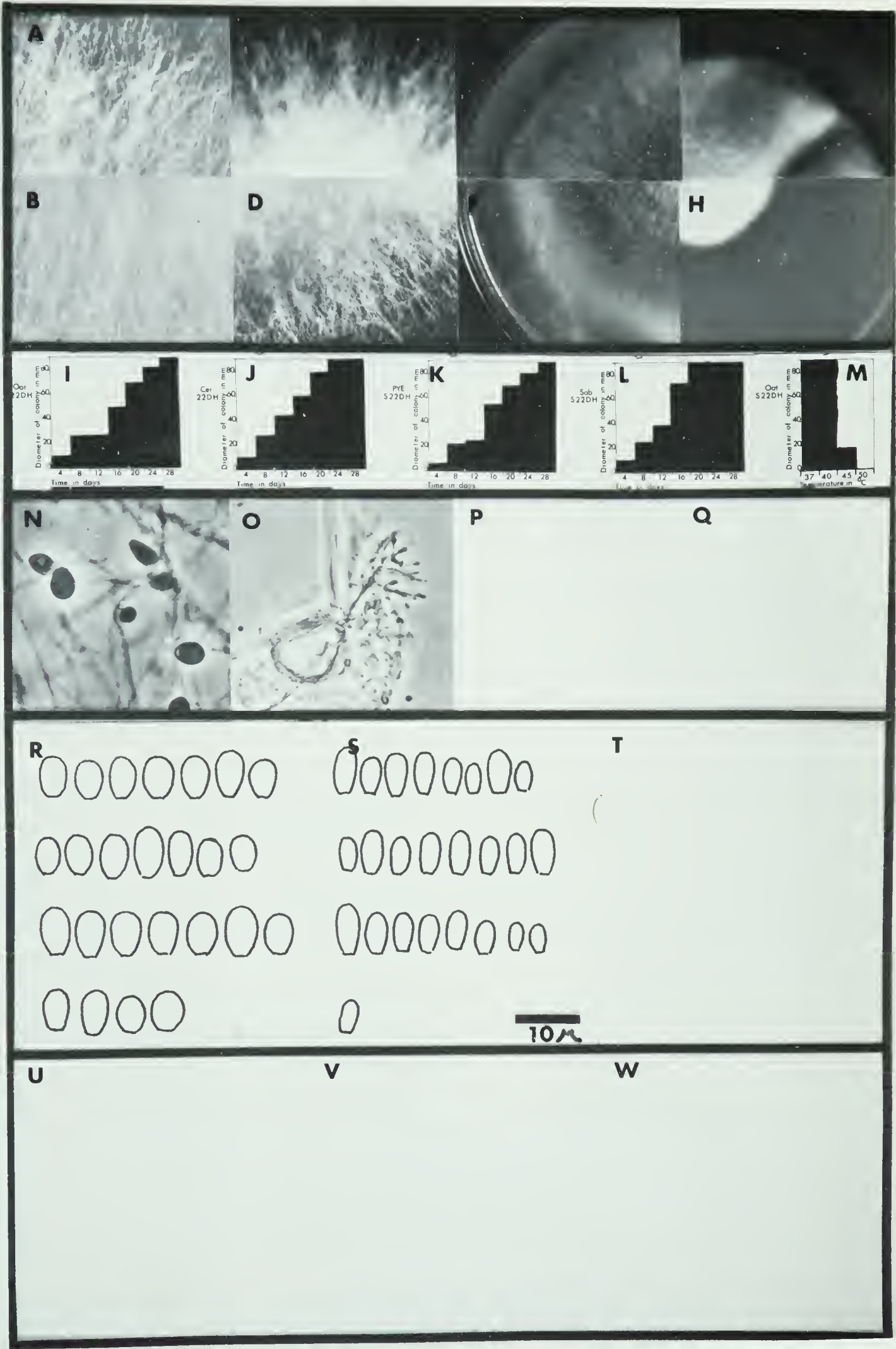




Plate #39: *Petriellidium boydii* UAMH 4410

Isolated from pasture soil, Alberta, 1980 by V. Mann

Entered 1980 as *Petriellidium boydii* S22 LH

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. gray/mod.
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Mod. mouse brown/gold
 - 4) Sab- White/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-8 x 3.5-5.5 μ m Figs. N,R
- b. Synnematus conidia- 5-6.5 x 1.5-3.5 μ m Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is a typical *P. boydii* anamorph.

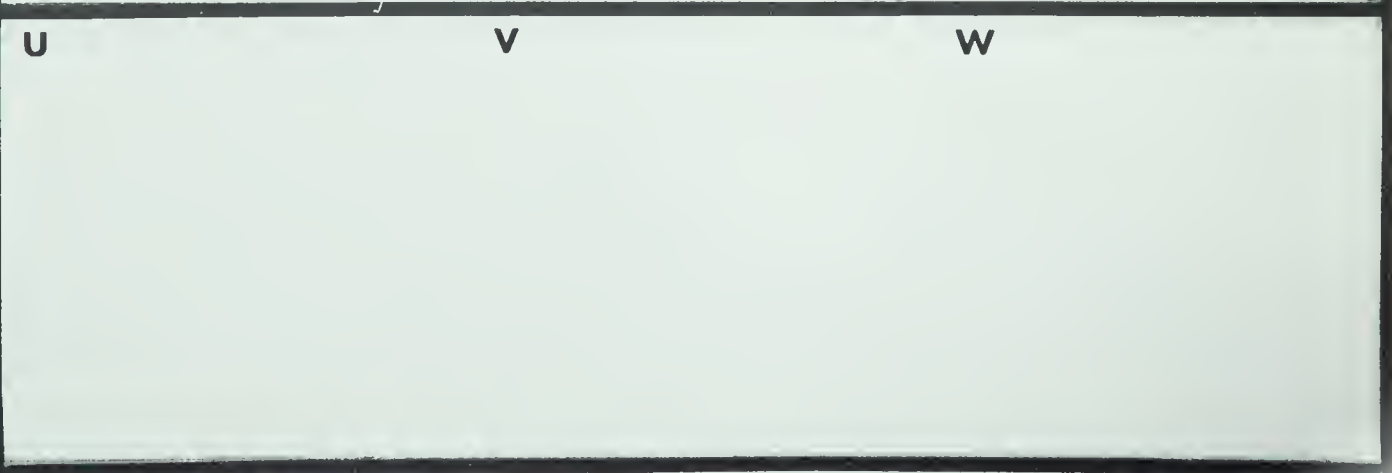
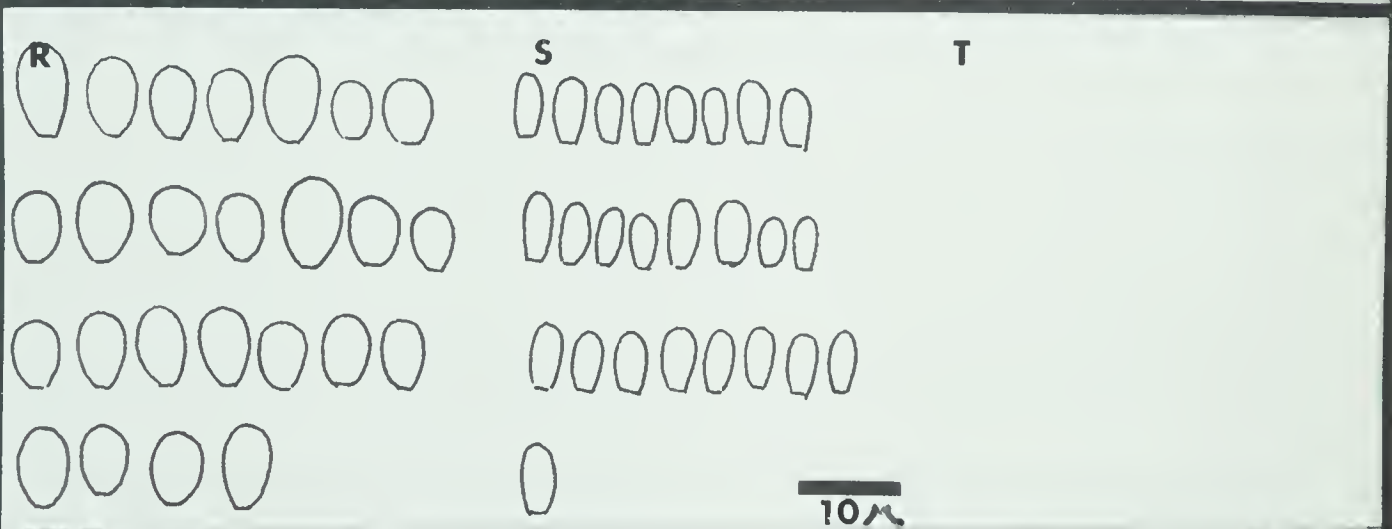
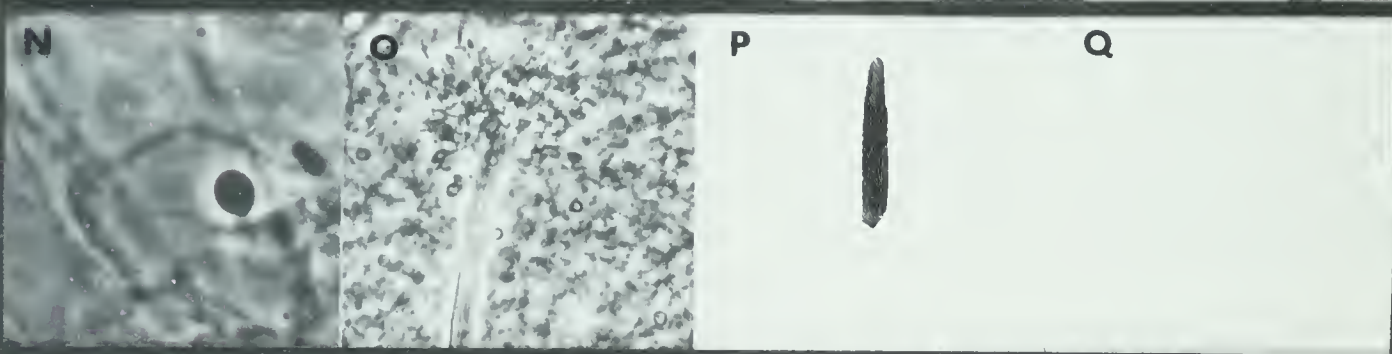
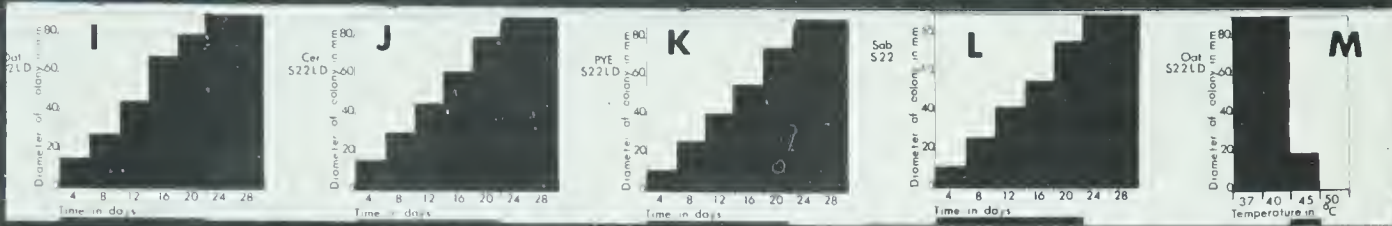
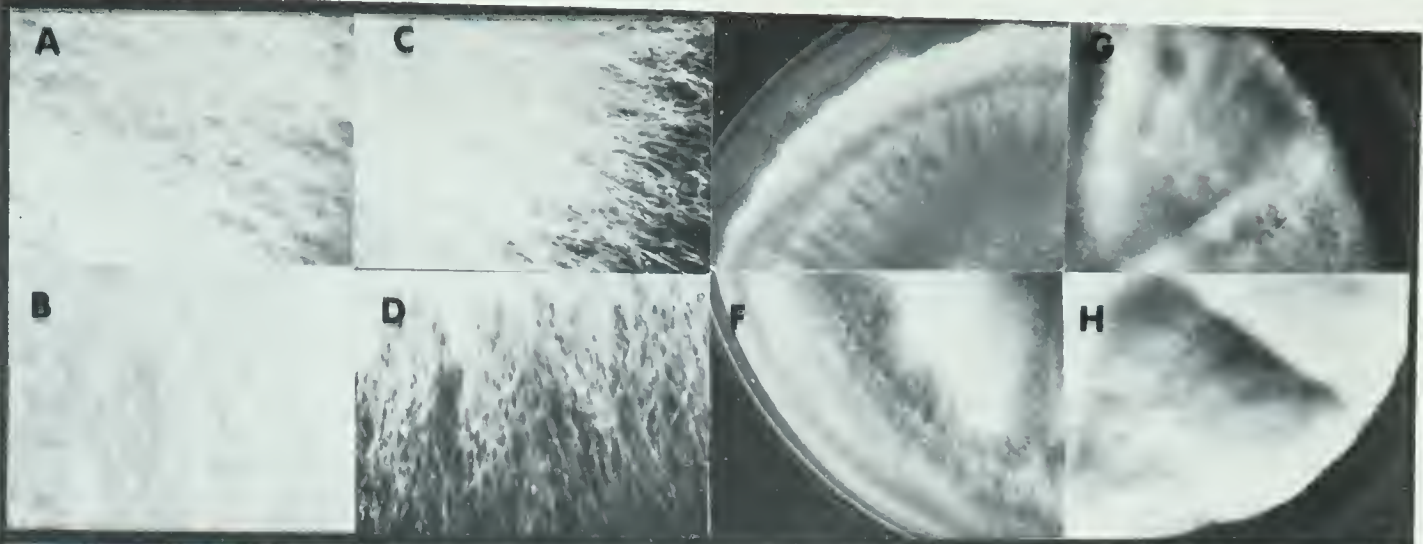


Plate #40: *Petriellidium africanum* UAMH 4000

Isolated from sandy soil, Africa, 1972 by G. Franz

Received 1976 from CBS as *P. africanum* Type CBS 311.72

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Clear/light
 - 2) Cer- Cream tan/none
 - 3) PYE- Gold cream/gold tan
 - 4) Sab- Cream tan/lt. cream tan

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 3.5-6 x 1-2.5 μ m Figs. N,R
- b. Synnemalous conidia- 3-5.5 x 1-2 μ m Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

This is the type strain of *P. africanum*. No other strains have been reported.

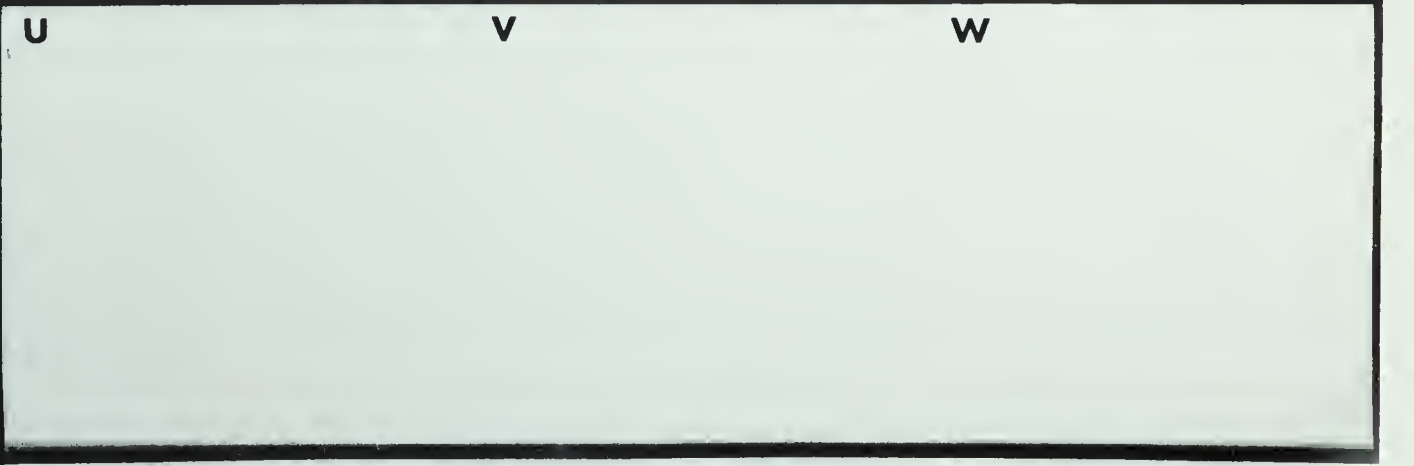
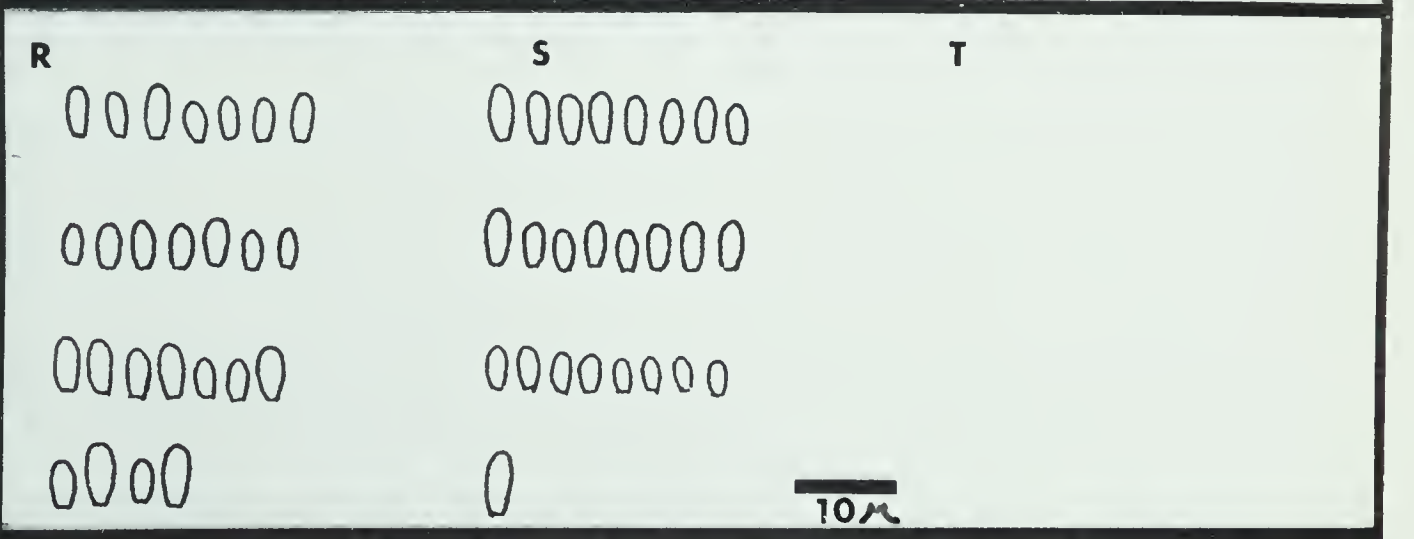
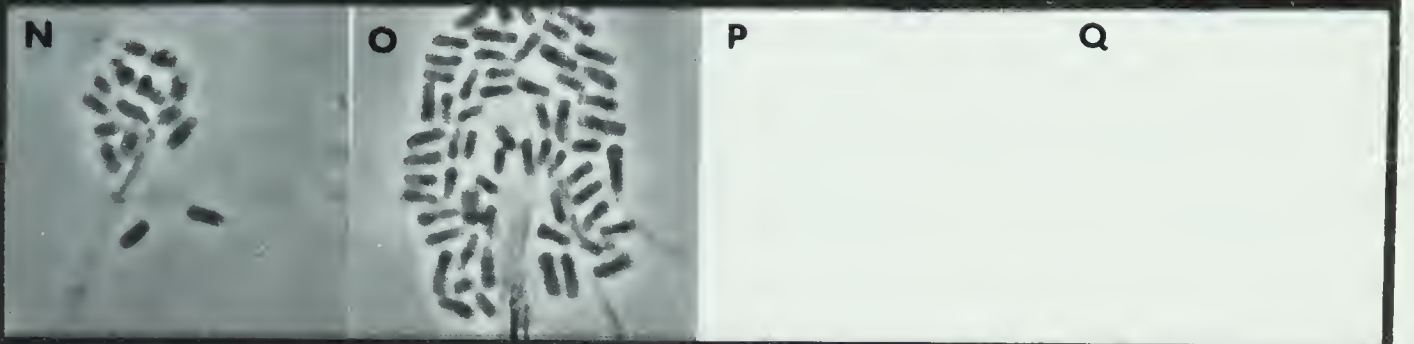
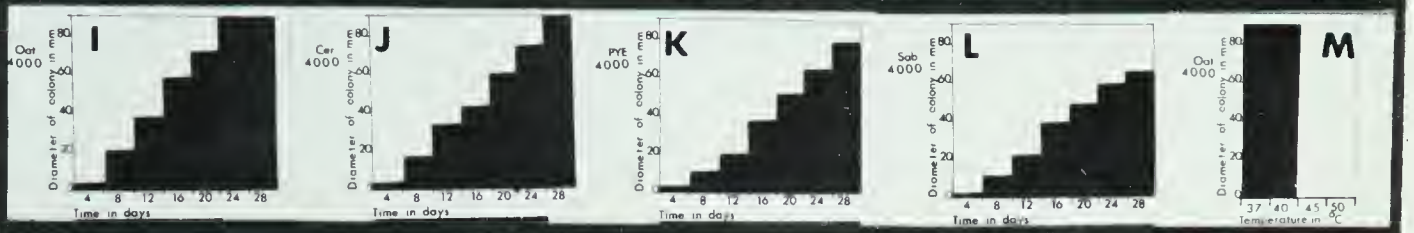
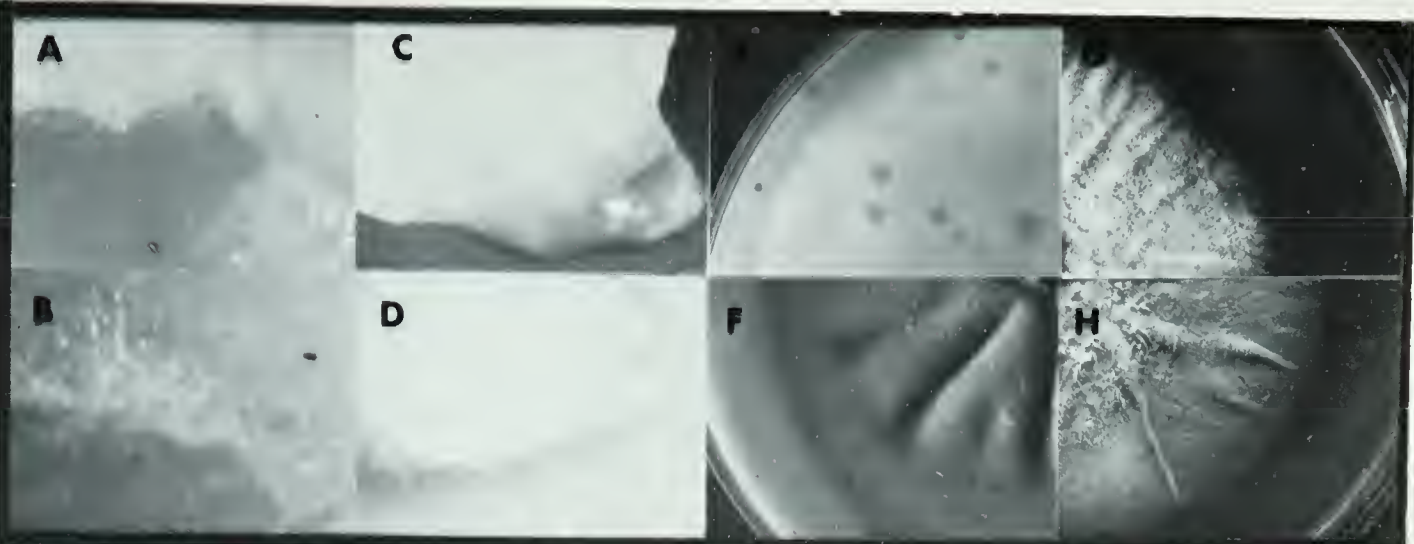


Plate #41: *Petriellidium angustum* UAMH 3984

Isolated from sewage half digestion tank, USA, 1972 by
D. Malloch

Received 1976 from CBS as *Petriellidium angustum* Type
CBS 254.72

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. mouse brown/light
 - 2) Cer- Lt. mouse brown/none
 - 3) PYE- Off white/yellow
 - 4) Sab- Off white/cream yellow

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5-7.5 x 2.5-4.5 μ m Figs. N,R
- b. Synnematus-like conidia- Figs. O,S
- c. Ascocarps- 40-68.5 μ m dia. Figs. P,U
- d. Ascospores- 5-6.5 x 2.5-3.5 μ m, golden Figs. Q,T,V,W

4. Comments

This is the type strain of *P. angustum*. It differs from *Petriellidium boydii* mainly in ascospore size. The *Scedosporium* state is identical to that of *Petriellidium boydii*.

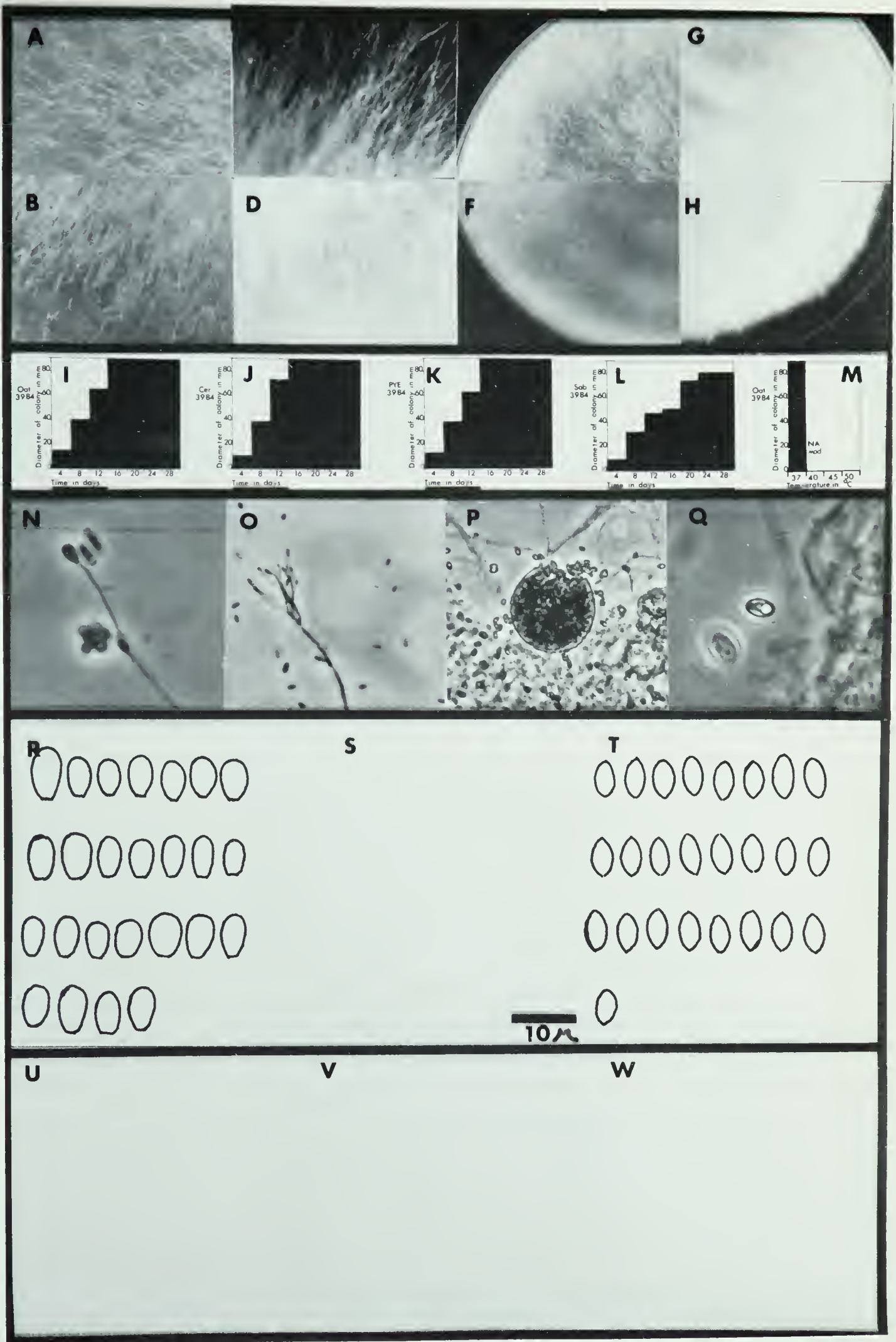


Plate #42: *Petriellidium angustum* UAMH 1101

Isolated from Brazil nut by Orr

Received 1961 from Orr as *Allescheria boydii* UCLA-M-148

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Mod. mouse brown(mod. grey)/mod.dark
 - 2) Cer- Off white/none
 - 3) PYE- Lt. mouse brown/yellow with a brown ring
 - 4) Sab- Off white/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6.5-10 x 4-6 μ m Figs. N,R
- b. Synnematus conidia- not seen Figs. O,S
- c. Ascocarps- 92-143 μ m dia. Figs. P,U
- d. Ascospores- 5.5-6.5 x 2-4 μ m, golden Figs. Q,T,V,W

4. Comments

This strain was originally identified as
Petriellidium boydii

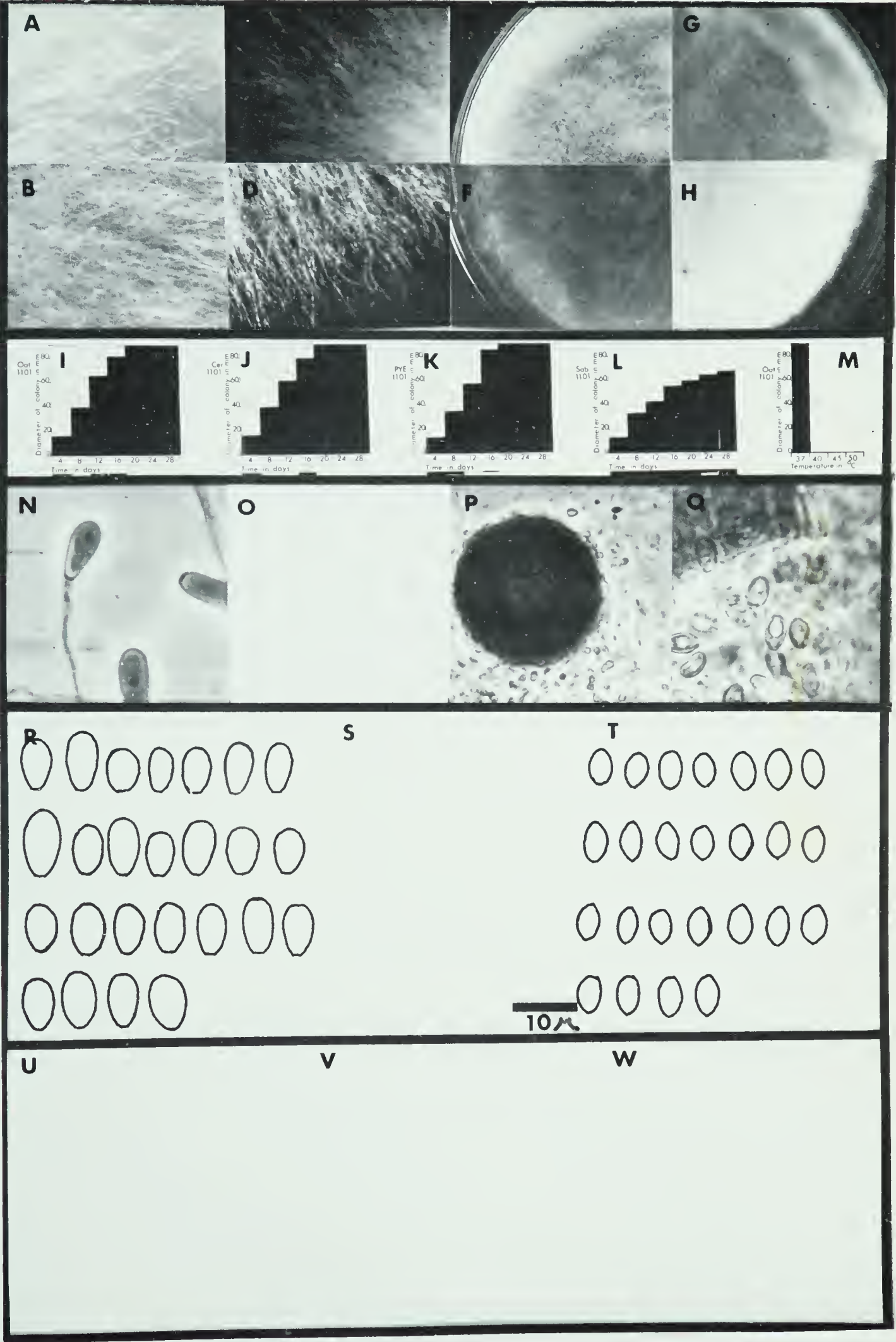




Plate #43: *Petriellidium angustum* UAMH 3992

Isolated from soil, Surinam, by J. H. van Emden

Received 1976 from CBS as *Petriellidium boydii* CBS

593.73

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. mouse brown/ light
 - 2) Cer- Off white/none
 - 3) PYE- Off white/yellow
 - 4) Sab- Off white/yellow

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-8 x 3-5 μ m Figs. N,R
- b. Synnemalous conidia- 3.5-6 x 1.5-2 μ m Figs. O,S
- c. Ascocarps- 76 μ m dia. Figs. P,U
- d. Ascospores- 5-7 x 2-3.5 μ m, golden Figs. Q,T,V,W

4. Comments

This strain was originally identified as
Petriellidium boydii.

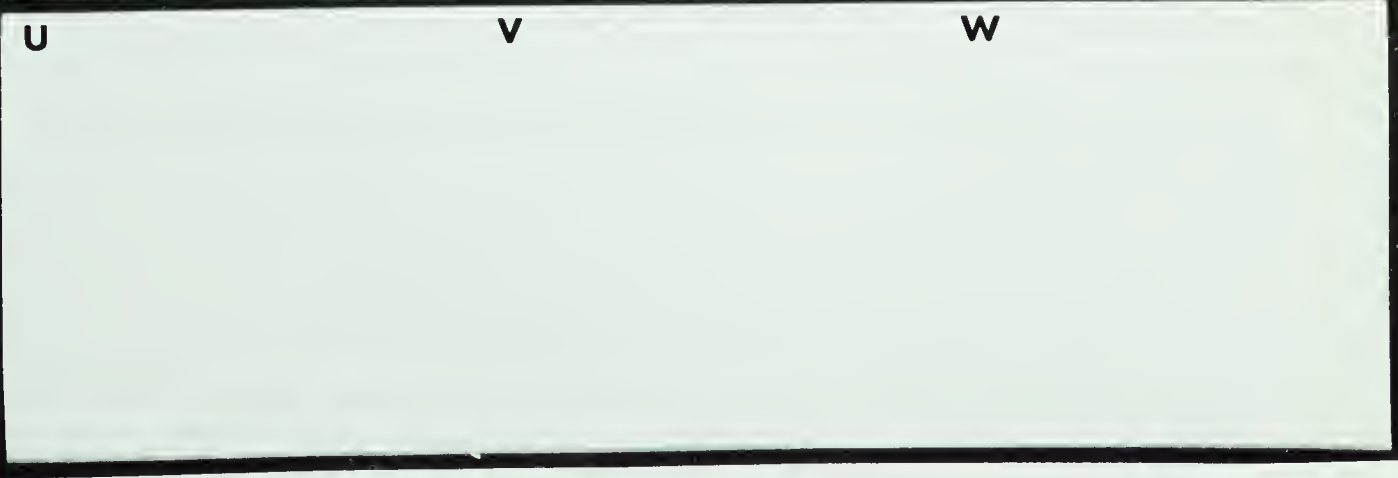
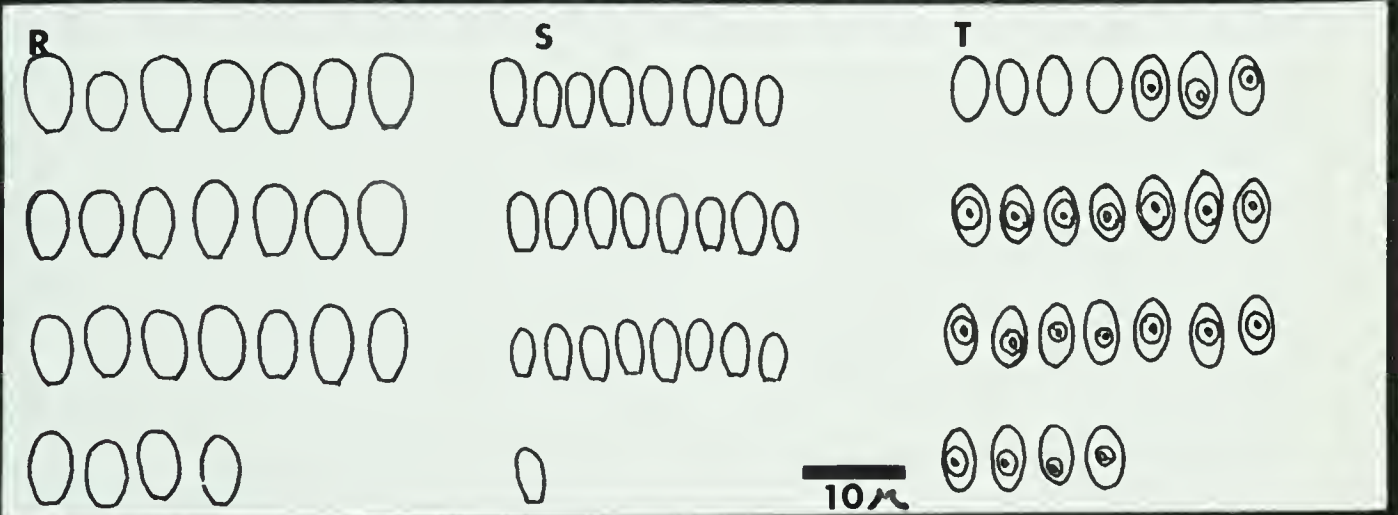
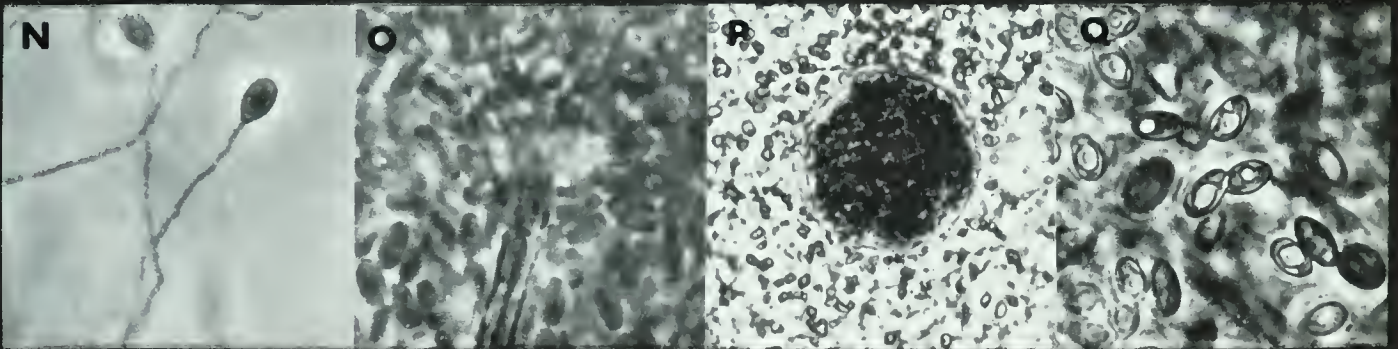
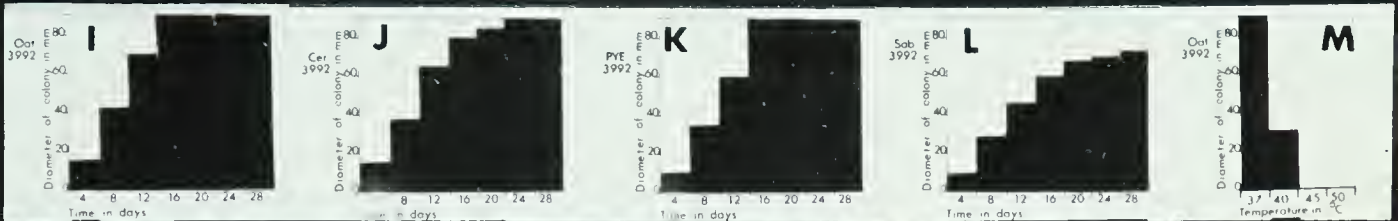
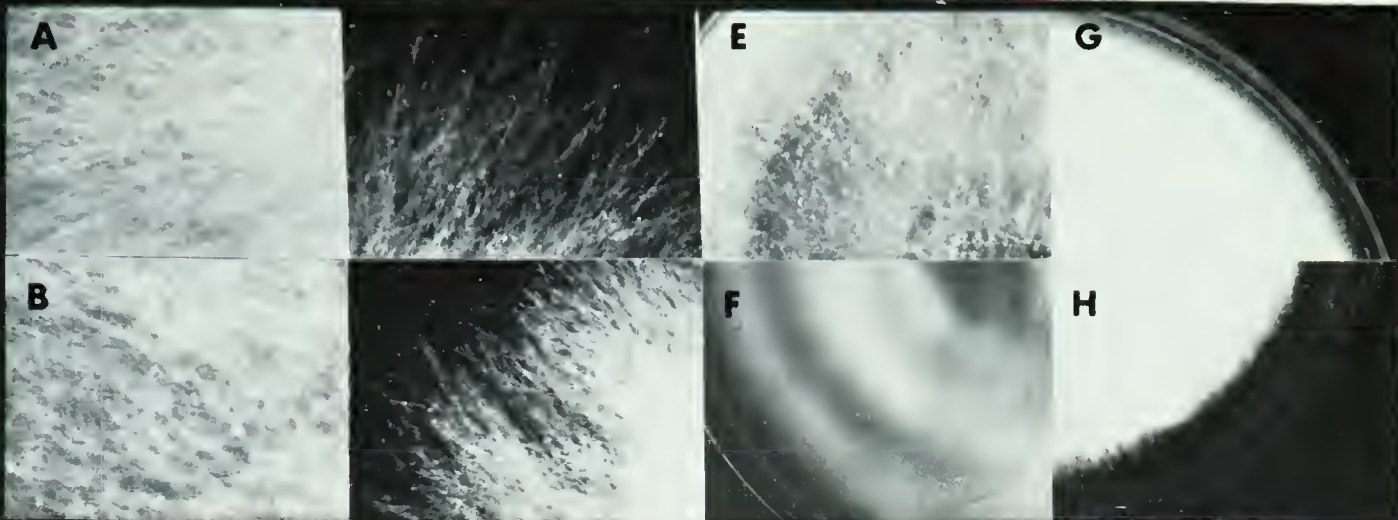




Plate #44: *Petriellidium angustum* UAMH 3997

Isolated from soil, Panama, 1953 by L. Ajello

Received 1976 from CBS as *Petriellidium fusoides* Type
CBS 106.53

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark mouse brown/dark
 - 2) Cer- Dark mouse brown/none
 - 3) PYE- Mod. mouse brown-grey/yellow tan
 - 4) Sab- Lt. gray/lt. tan

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5.5-8 x 3-4.5 μ m Figs. N,R
- b. Synnematos conidia- 3.5- 6.5 x 1.5-2 μ m Figs. O,S
- c. Ascocarps- 65-107.5 μ m dia. Figs. P,U
- d. Ascospores- 5.5-7 x 2.5-3.5 μ m, golden Figs. Q,T,V,W

4. Comments

This strain was originally identified as *A. boydii*
but von Arx later reclassified it as *P. fusoides*.

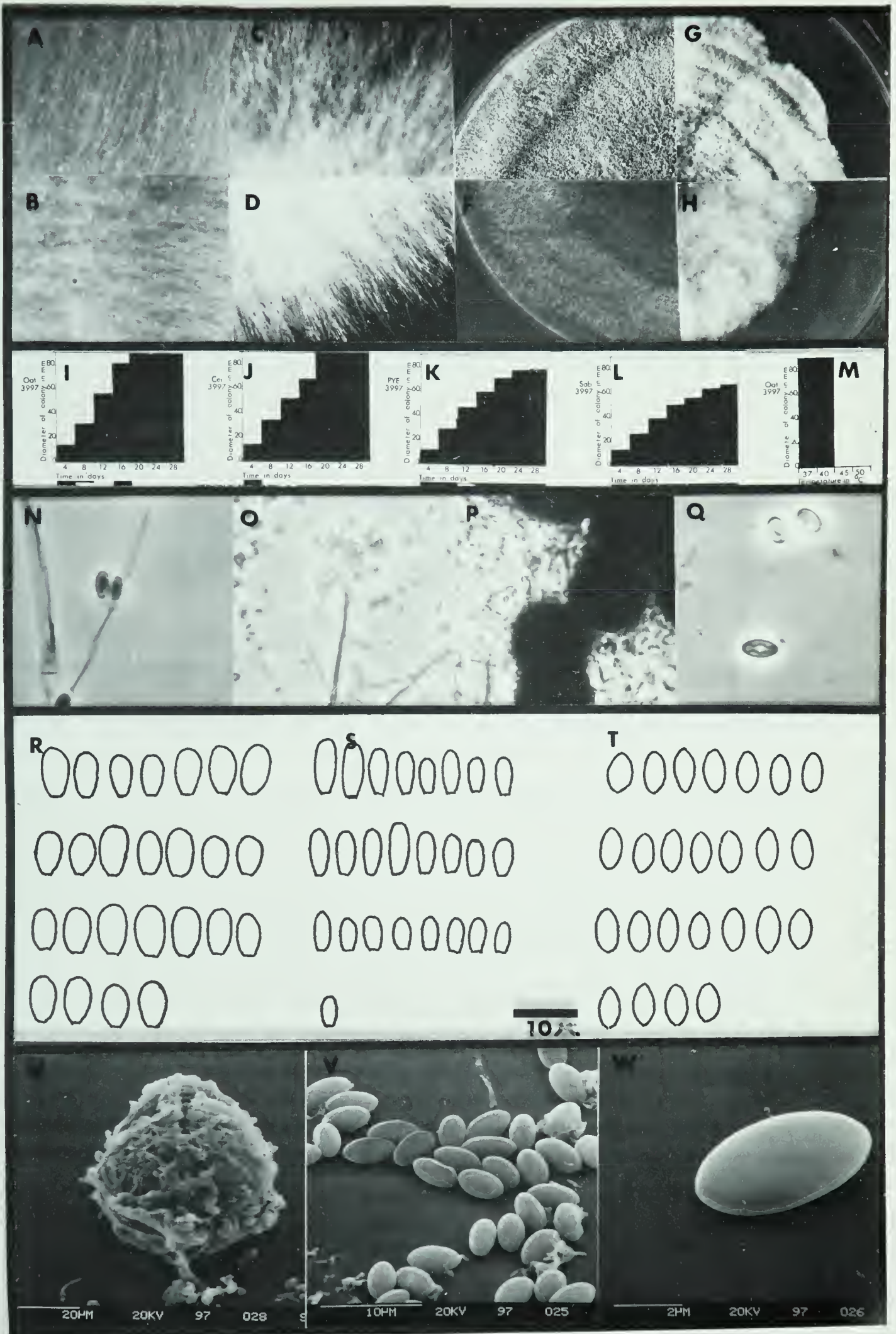




Plate #45: *Petriellidium desertorum* UAMH 3993

Isolated from salt marsh soil, Kuwait, 1972 by A. F.

Moustafa

Received 1976 from CBS as *Petriellidium desertorum* Type
CBS 489.72

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Off white/light
 - 2) Cer- Off white/none
 - 3) PYE- Off white/dark tan
 - 4) Sab- White/cream yellow

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 4-8 x 1.5-4 μ m Figs. N,R
- b. Synnemalous conidia- not seen
- c. Brown chlamydospores- 10-15 x 7.5-13 μ m Figs. O,S
- d. Ascocarps- 68.5-108.5 μ m dia. Figs. P,U
- e. Ascospores- 11-14 x 7-8 μ m, golden Figs. Q,T,V,W

4. Comments

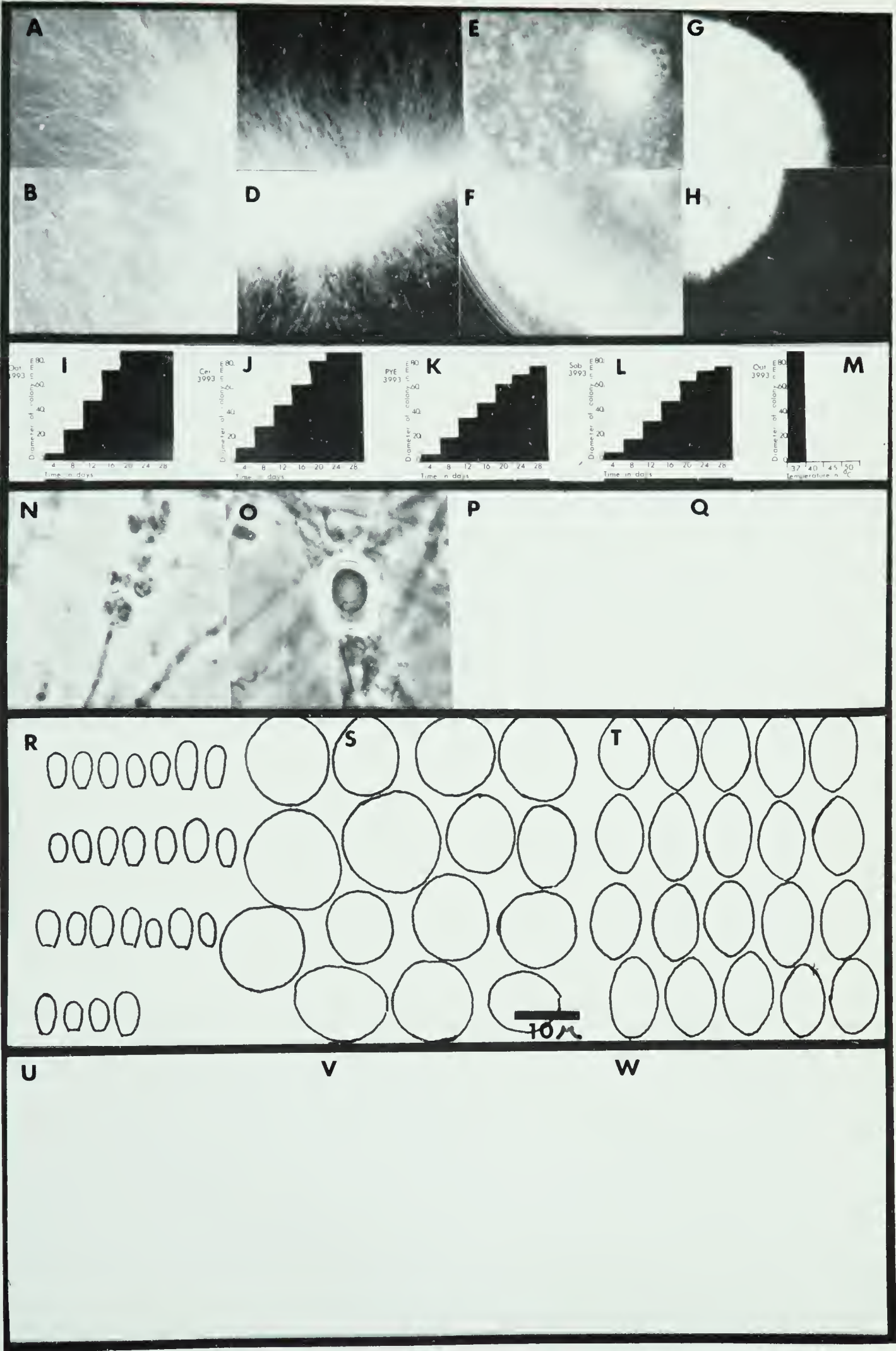




Plate #46: *Petriellidium fimeti* UAMH 4257

Isolated from dung of nilgai, India, by K. G. Mukerji

Received 1979 from CBS as *Petriellidium fimeti* Type CBS
129.78 mixed with *Pithoascus langeronii*

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. mouse brown/light
 - 2) Cer- Lt. grey/slight orange
 - 3) PYE- Mod. grey/dark brown
 - 4) Sab- Dark olive green/dark olive green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- not seen Figs. N,R
- b. Synnematos conidia- not seen Figs. O,S
- c. Ascocarps- 81.5-225 μ m dia. Figs. P,U
- d. Ascospores- 10-13 x 7-9 μ m, golden Figs. Q,T,V,W

4. Comments

The ascospores of this strain germinated from both
germ pores.

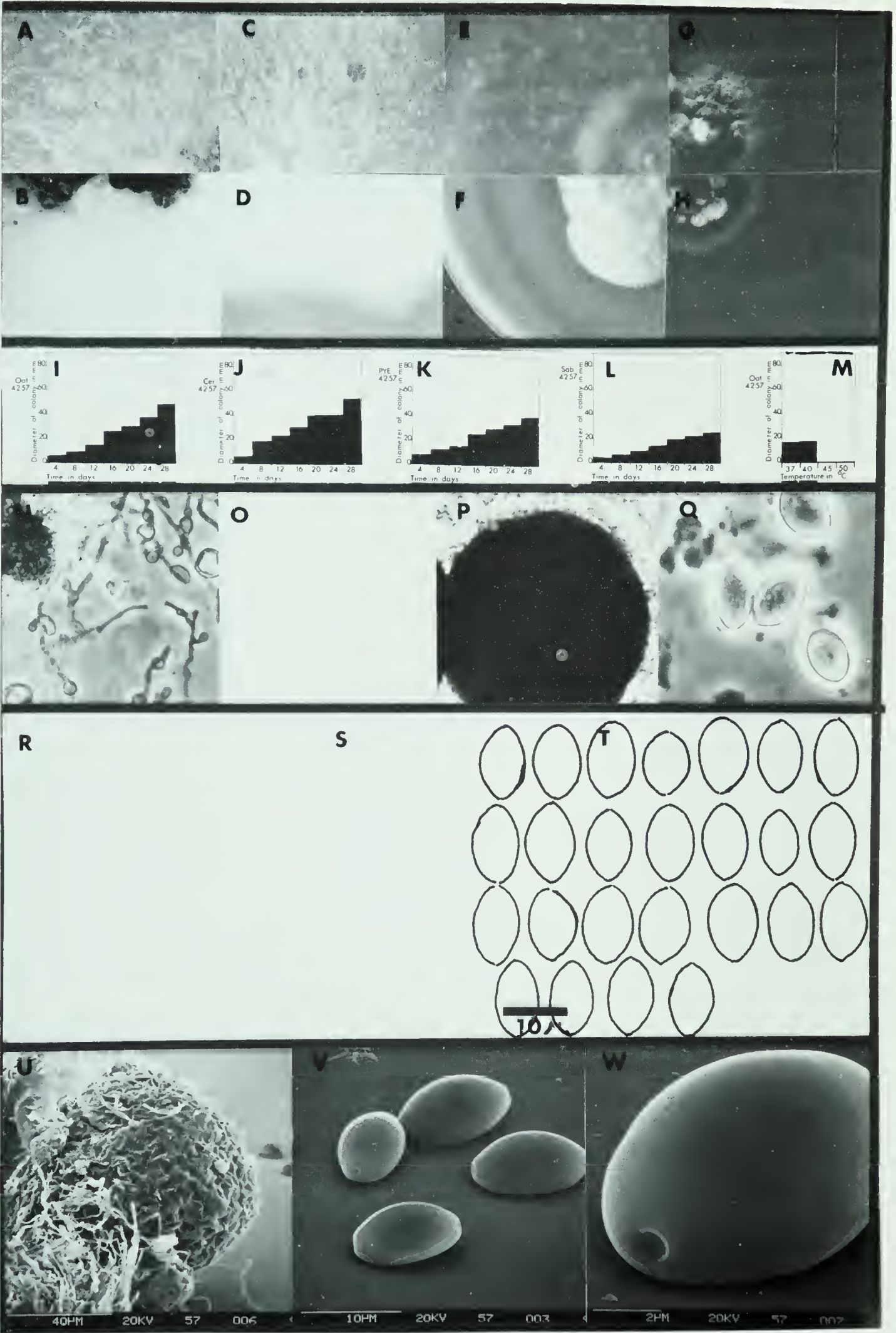




Plate #47: *Petriella guttulata* UAMH 3996

Isolated from partridge dung, by G. L. Barron

Received 1976 from CBS *Petriella guttulata* CBS 362.61

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Clear with lt. mouse brown ring/light
 - 2) Cer- Off white/none
 - 3) PYE- Cream yellow green/yellow green
 - 4) Sab- Cream/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 4-7 x 1-3 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

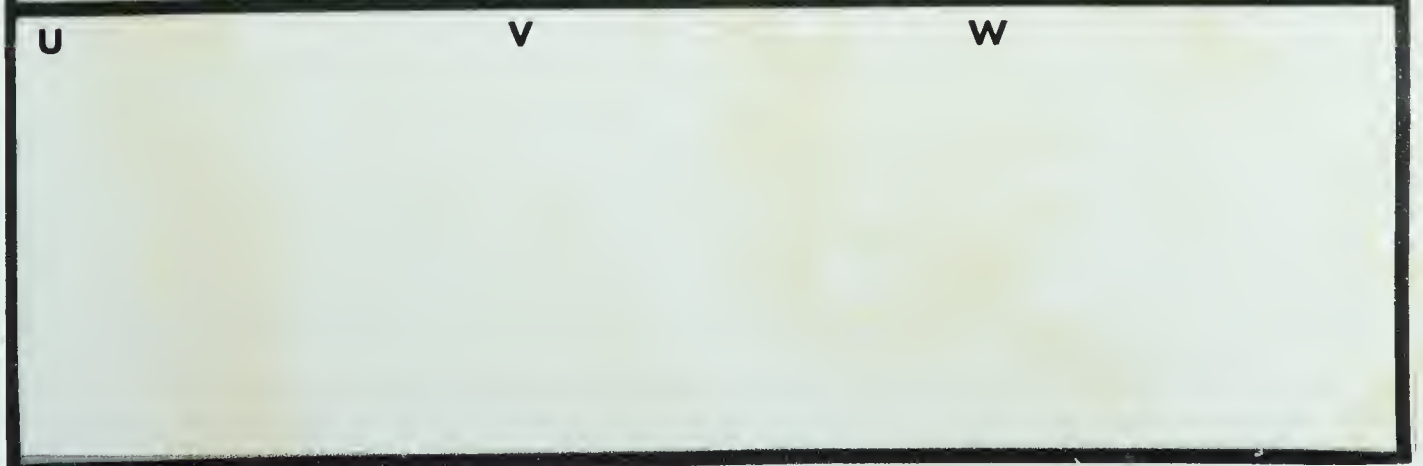
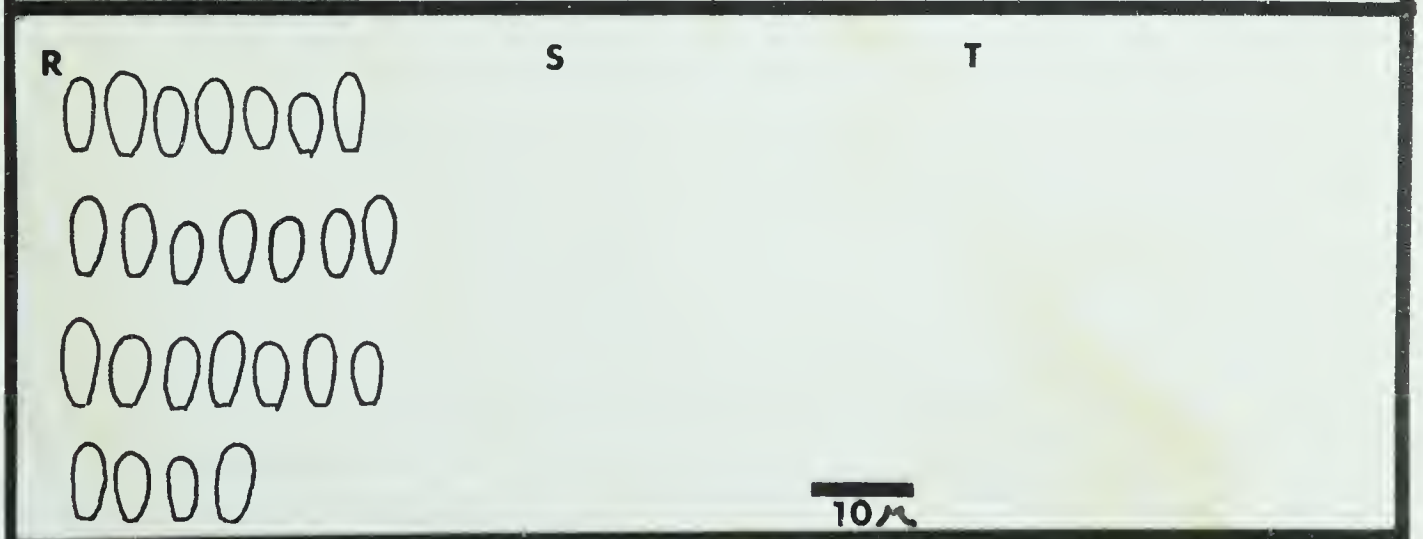
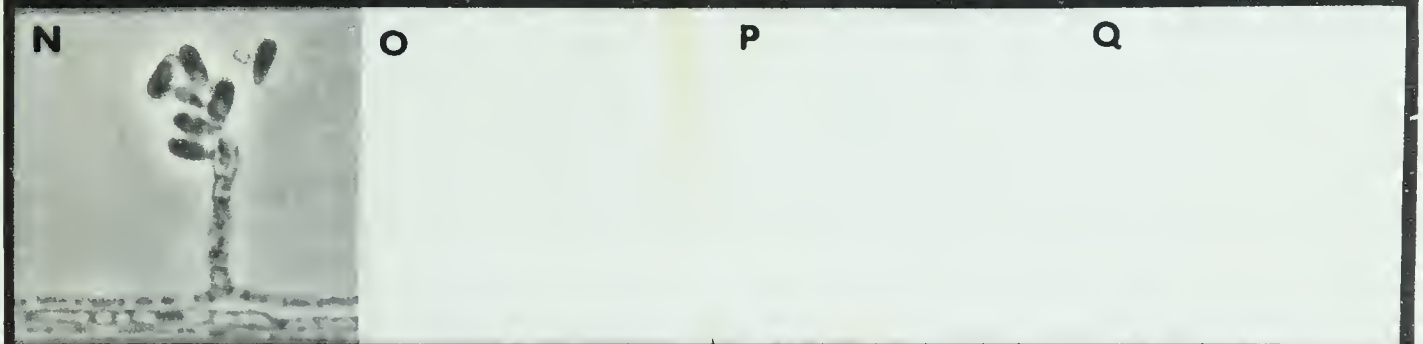
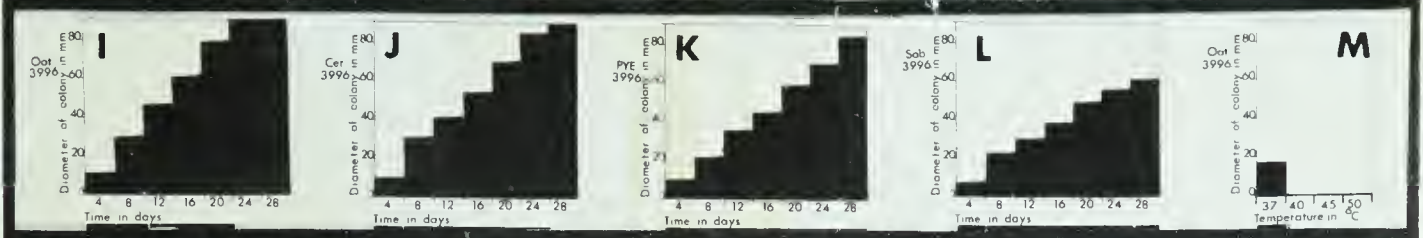
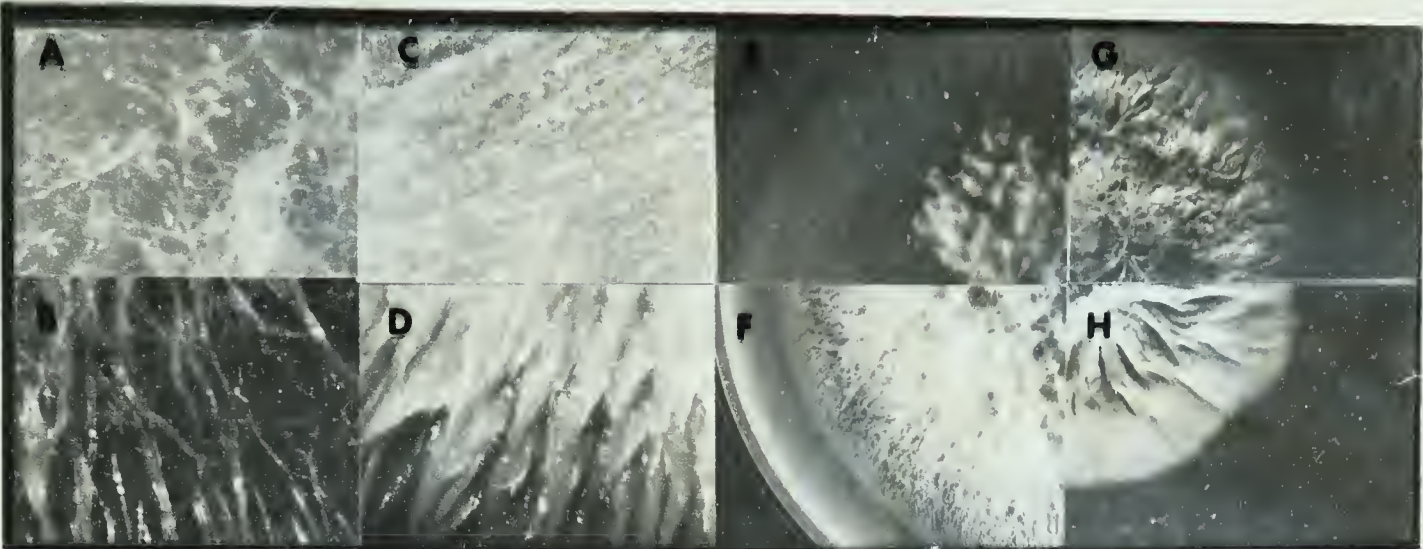




Plate #48: *Petriella lindforsii* UAMH 3999

Isolated

Received 1976 from CBS as *Petriella lindforsii* CBS

352.59

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Clear/light
 - 2) Cer- Camel/none
 - 3) PYE- Cream yellow/yellow
 - 4) Sab- Cream pale yellow/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 5-8 x 2.5-4 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- measurement not available Figs. P,U
- d. Ascospores- 8-9.5 x 3.5-5 μ m, golden Figs. Q,T,V,W

4. Comments

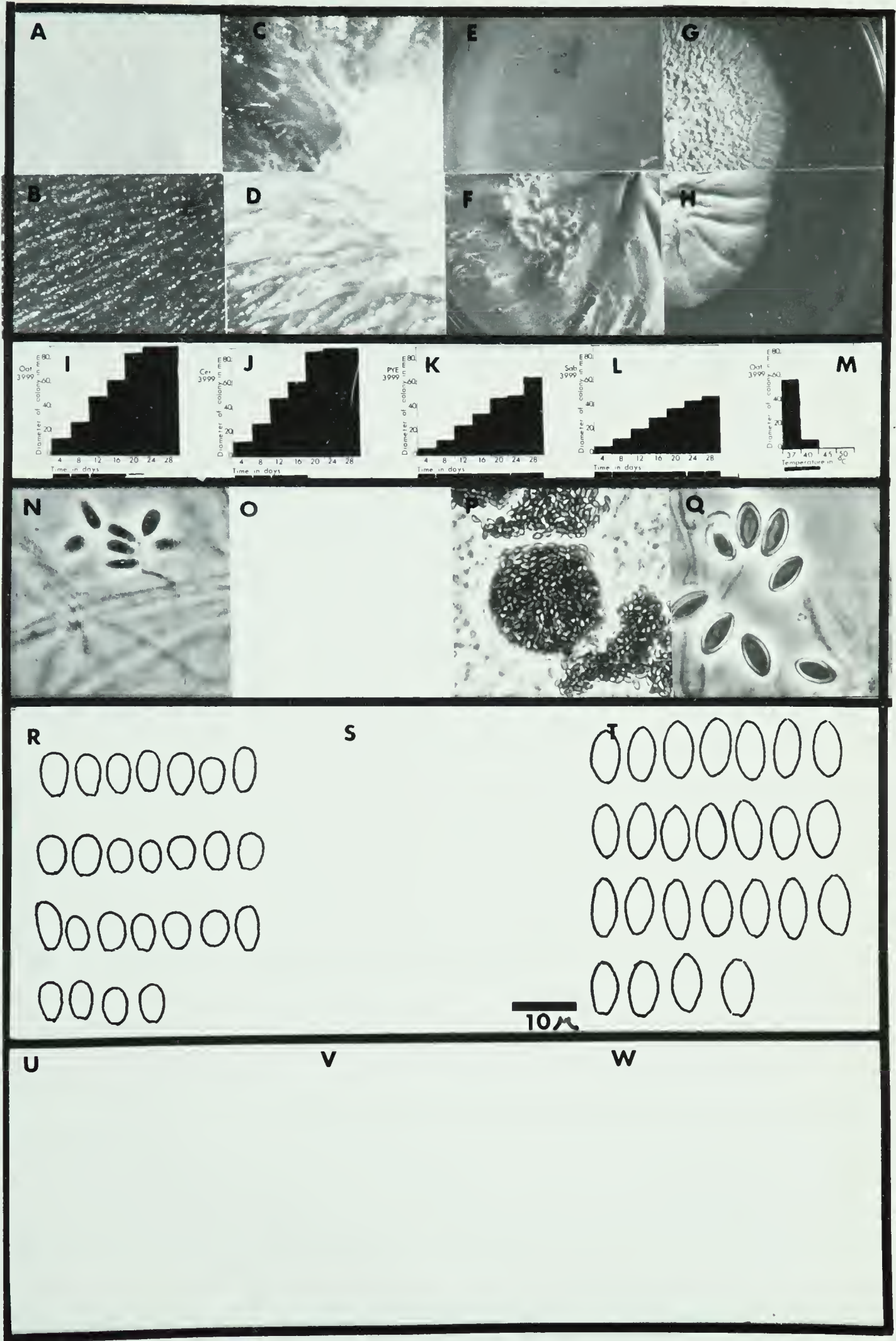


Plate #49: *Petriella musispora* UAMH 3986

Isolated from wood, by D. Malloch

Received 1976 from CBS as *Petriella musispora* Type CBS
745.69

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Lt. grey-green/light
 - 2) Cer- Lt.grey/none
 - 3) PYE- Pale cream yellow/yellow
 - 4) Sab- Pale green/lt. cream green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 4.5-8.5 x 1-2 μ m Figs. N,R
- b. Chlamydospores Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

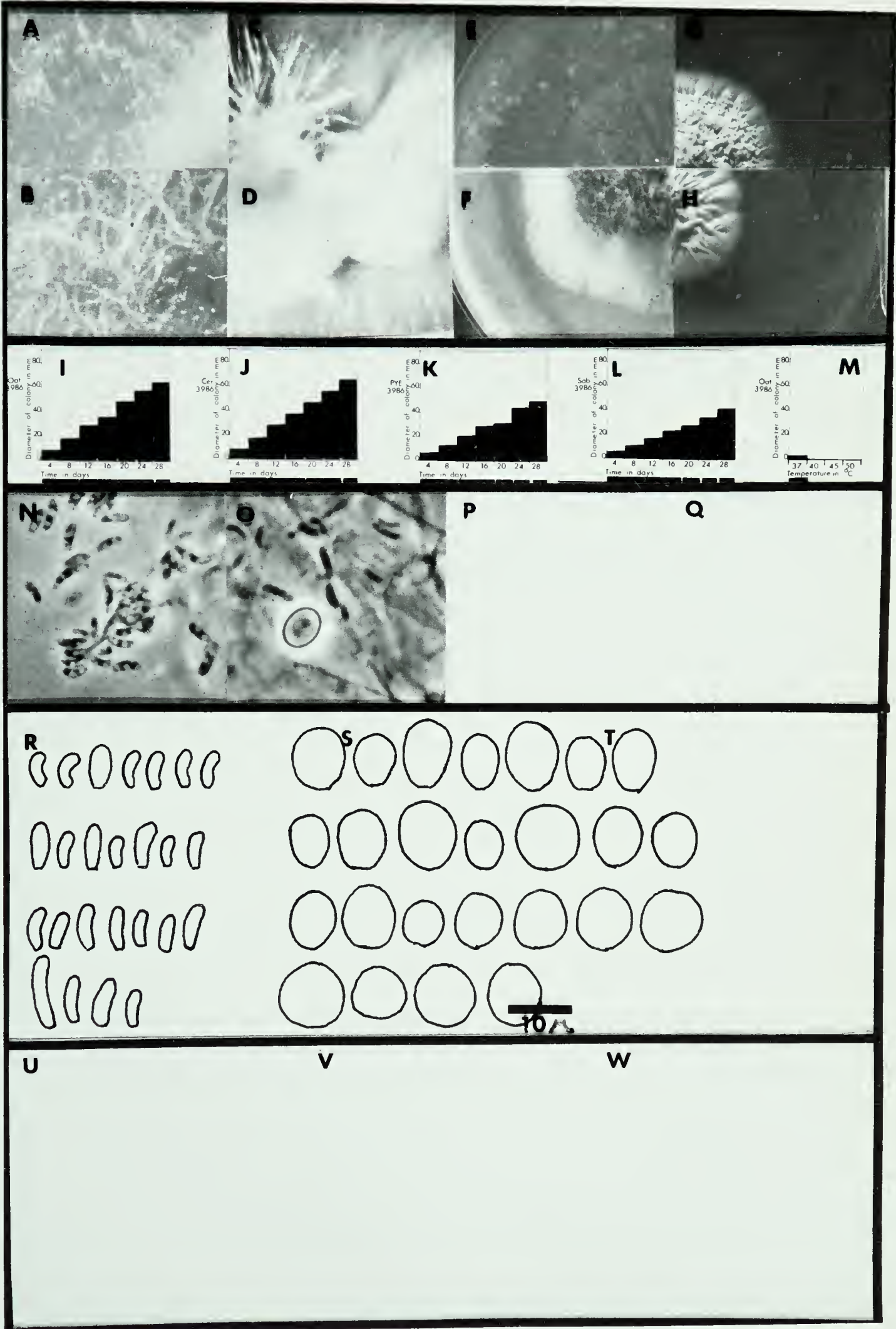




Plate #50: *Petriella setifera* UAMH 1662

Isolated as contaminant, Edmonton, 1963 by J. W.

Carmichael

Entered 1963 as *Petriella setifera*

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Clear with lt. mouse brown ring/light
 - 2) Cer- Off white with mouse brown/none
 - 3) PYE- Mod. mouse brown/yellow green
 - 4) Sab- Cream yellow tan/cream lt. tan

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6-9.5 x 3-4.5 μ m Figs. N,R
- b. Synnematus conidia- 6-12 x 2 4.5 μ m Figs. O,S
- c. Ascocarps- 50-123 μ m dia. Figs. P,U
- d. Ascospores- 8-11 x 4-5 μ m, golden Figs. Q,T,V,W

4. Comments

This is not the type strain, however the type strain no longer produces ascospores. Three additional strains were included in the quantitative analysis: UAMH 805, UAMH 1924 from Tokyo soil, and UAMH 2702 from corn field soil.

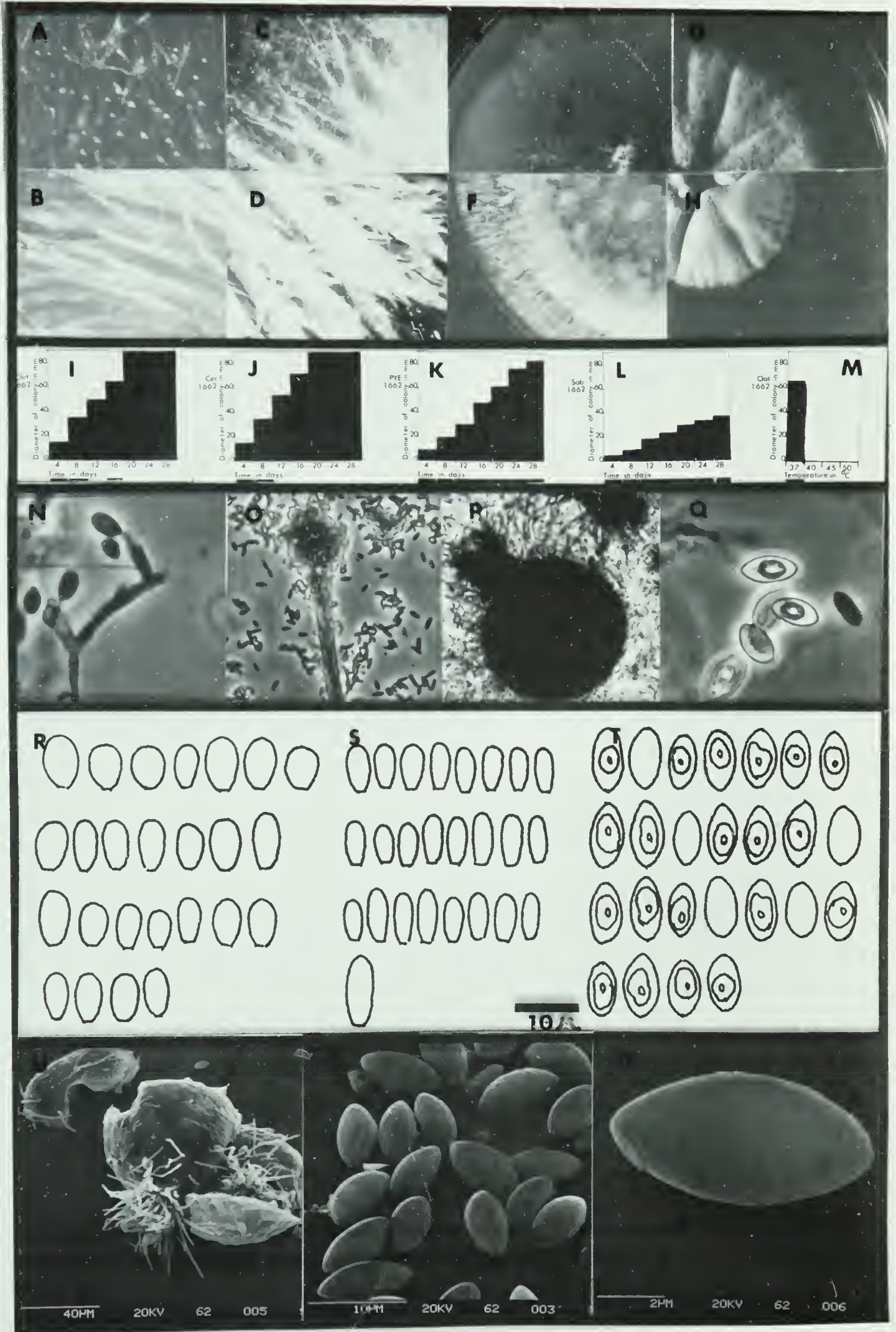




Plate #51: *Petriella sordida* UAMH 1410

Isolated from *Chrysanthemum*, Ottawa, 1958 by H. S.

Thompson

Received 1962 from Thompson as *Petriella asymmetrica*

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Pale green-grey/light
 - 2) Cer- Lt beige(pale green)/none
 - 3) PYE- Pale cream yellow/cream yellow
 - 4) Sab- Cream/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 4-7 x 2-4 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- 128 μ m dia. Figs. P,U
- d. Ascospores- 8-10 x 3-5 μ m, golden Figs. Q,T,V,W

4. Comments

This is not the type strain, however because the type no longer produces ascospores, this strain was illustrated. Two additional strains were included in the quantitative analysis: UAMH 3983 from *Pyrus communis* and UAMH 3985 from soil in mixed wood.

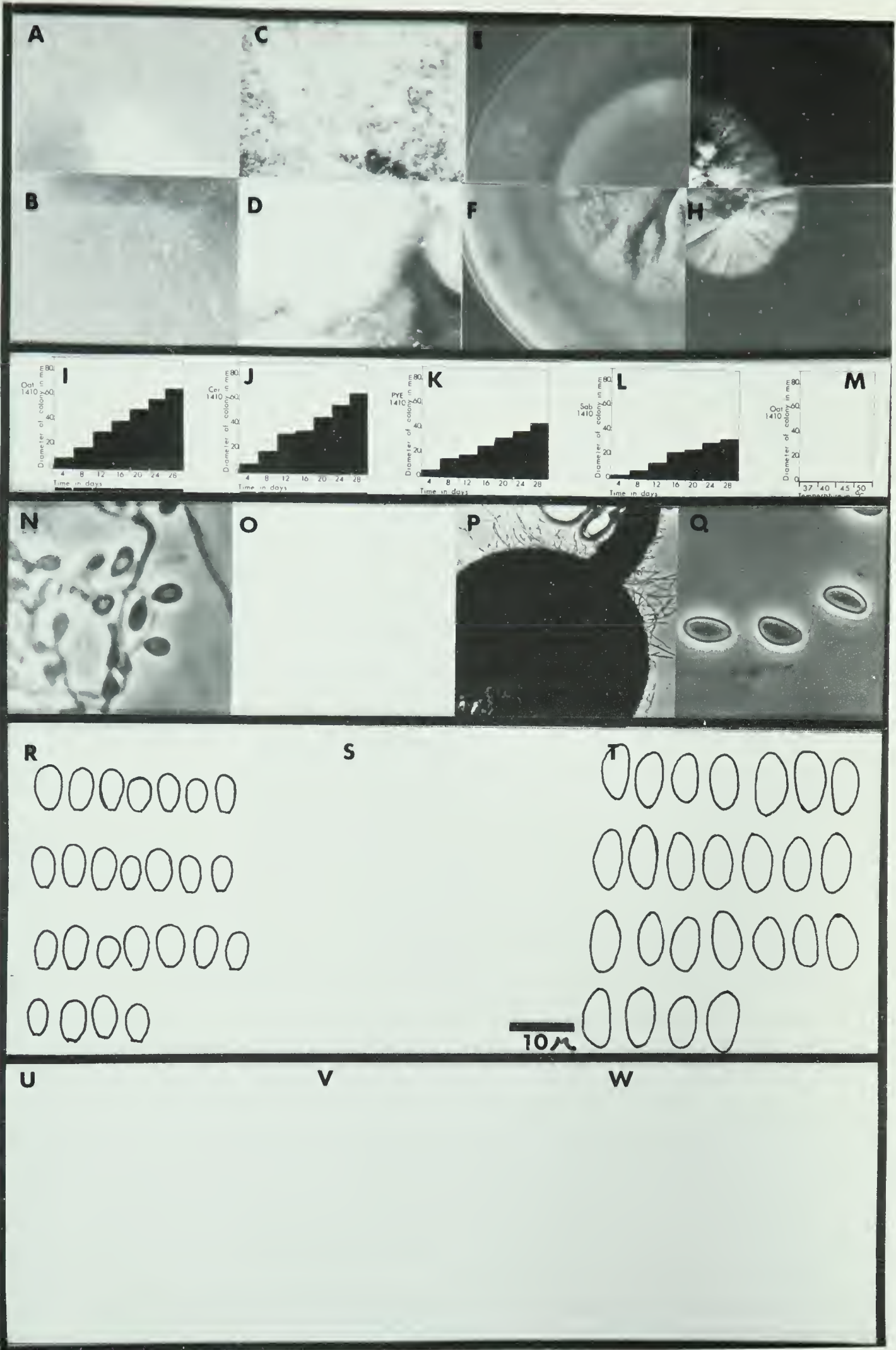


Plate #52: *Microascus desmosporus* UAMH 966

Isolated 1959

Received 1961 from CBS as *Microascus cirrosus* St.

Domsch

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark grey/light
 - 2) Cer- Dark olive green/none
 - 3) PYE- Mod. mouse brown-grey/cream lt. olive green
 - 4) Sab- Lt. cream olive green/lt. cream olive green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 3-5 x 2-4 μ m Figs. N,R
- b. Synnematos conidia- not seen Figs. O,S
- c. Ascocarps- 97.5-163.5 μ m dia. Figs. P,U
- d. Ascospores- 4-6 x 2.5-4 μ m, red Figs. Q,T,V,W

4. Comments

Also one strain from the wood samples was included in the quantitative analysis.

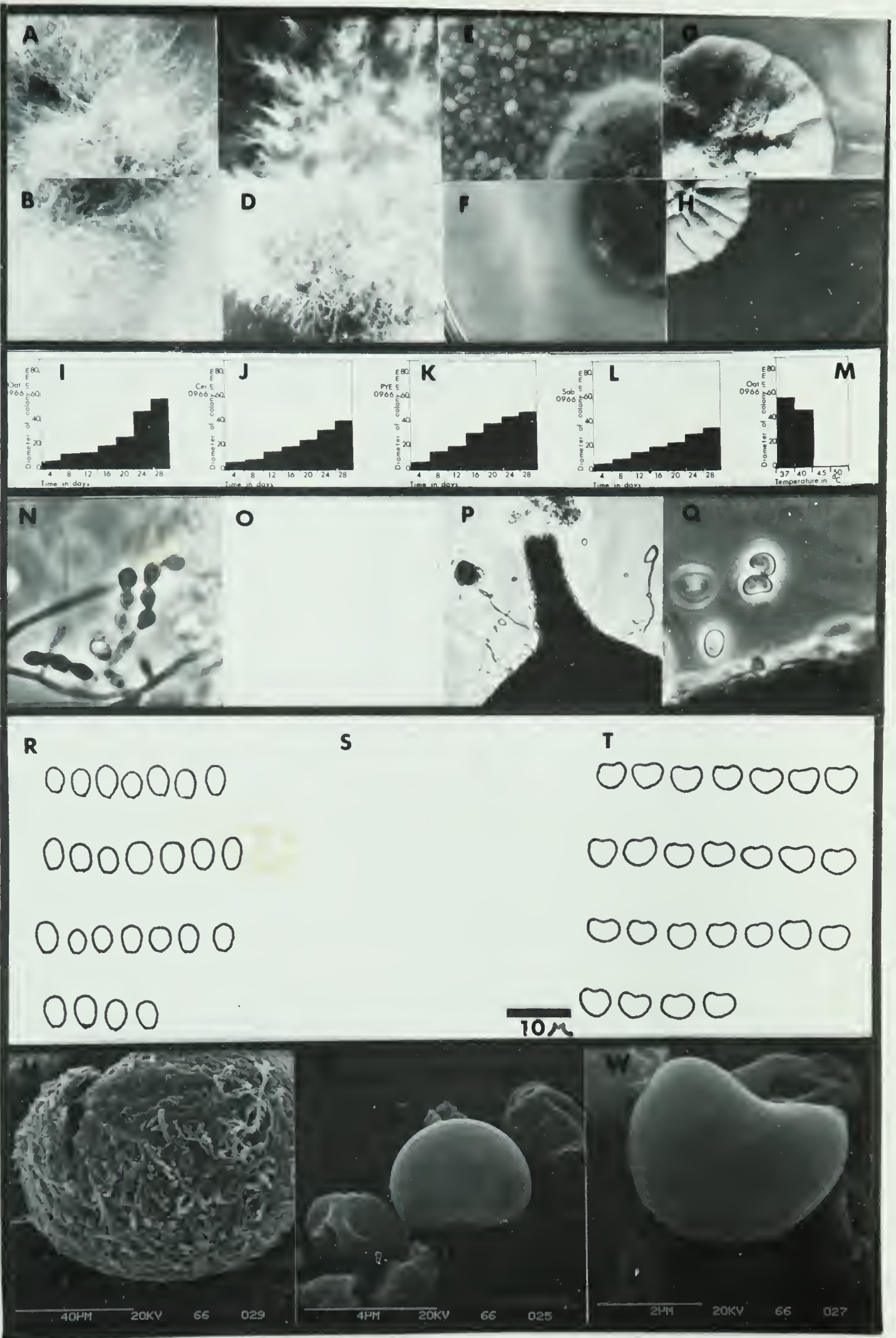


Plate #53: *Microascus intermedius* UAMH 2469

Isolated from hair, Edmonton, 1965 by J. W. Carmichael

Entered 1965 as *Microascus intermedius* My 925-65

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Cream/light
 - 2) Cer- Dark lime green/none
 - 3) PYE- Mod. grey-olive green/cream lt. green
 - 4) Sab- Dark olive green/mod. olive green

2. Growth Rates

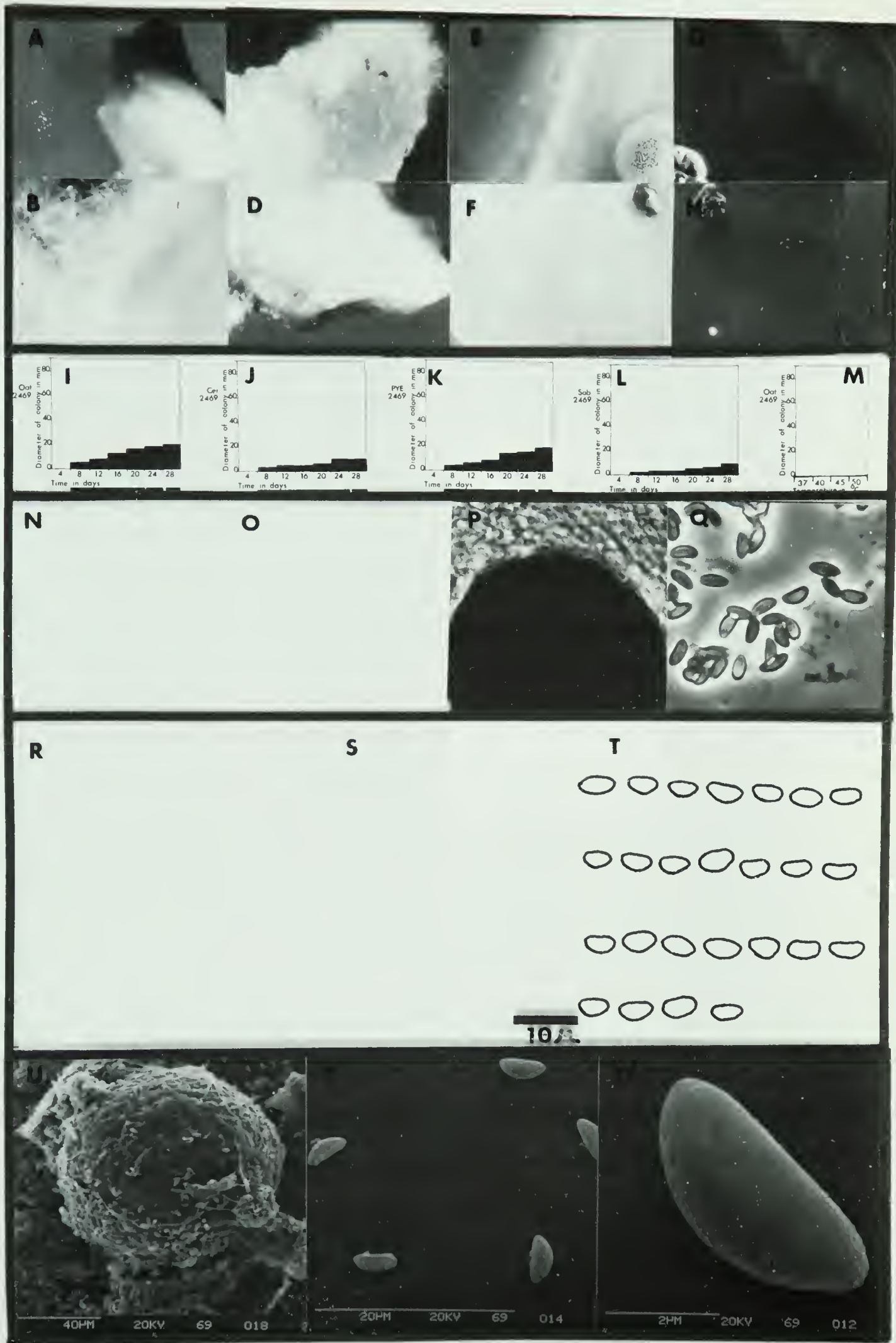
- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- not seen Figs. N,R
- b. Synnematus conidia- not seen Figs. O,S
- c. Ascocarps- 132-192 μ m dia. Figs. P,U
- d. Ascospores- 4-6 x 1.5-2.5 μ m, red Figs. Q,T,V,W

4. Comments

Von Arx reclassified this species as *Pithoascus intermedius*; however, from the results of this study it should remain in *Microascus*.



Date	Description	Amount	Balance	Total
1890	Jan 1	100.00	100.00	100.00
Feb 1	Jan 2	50.00	50.00	50.00
Mar 1	Jan 3	25.00	25.00	25.00
Apr 1	Jan 4	12.50	12.50	12.50
May 1	Jan 5	6.25	6.25	6.25
Jun 1	Jan 6	3.12	3.12	3.12
Jul 1	Jan 7	1.56	1.56	1.56
Aug 1	Jan 8	0.78	0.78	0.78
Sep 1	Jan 9	0.39	0.39	0.39
Oct 1	Jan 10	0.19	0.19	0.19
Nov 1	Jan 11	0.09	0.09	0.09
Dec 1	Jan 12	0.05	0.05	0.05
Jan 1	Jan 13	0.02	0.02	0.02
Feb 1	Jan 14	0.01	0.01	0.01
Mar 1	Jan 15	0.00	0.00	0.00
Apr 1	Jan 16	0.00	0.00	0.00
May 1	Jan 17	0.00	0.00	0.00

Plate #54: *Microascus longirostris* UAMH 408

Isolated from finger nails, Edmonton, 1955 by J. W.
Carmichael

Entered 1955 as *Microascus longirostris* P5407

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Off white/light
 - 2) Cer- Off white/none
 - 3) PYE- Off white/cream
 - 4) Sab- Off white/tan

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- not seen Figs. N,R
- b. Synnematos conidia- not seen Figs. O,S
- c. Ascocarps- not seen Figs. P,U
- d. Ascospores- not seen Figs. Q,T,V,W

4. Comments

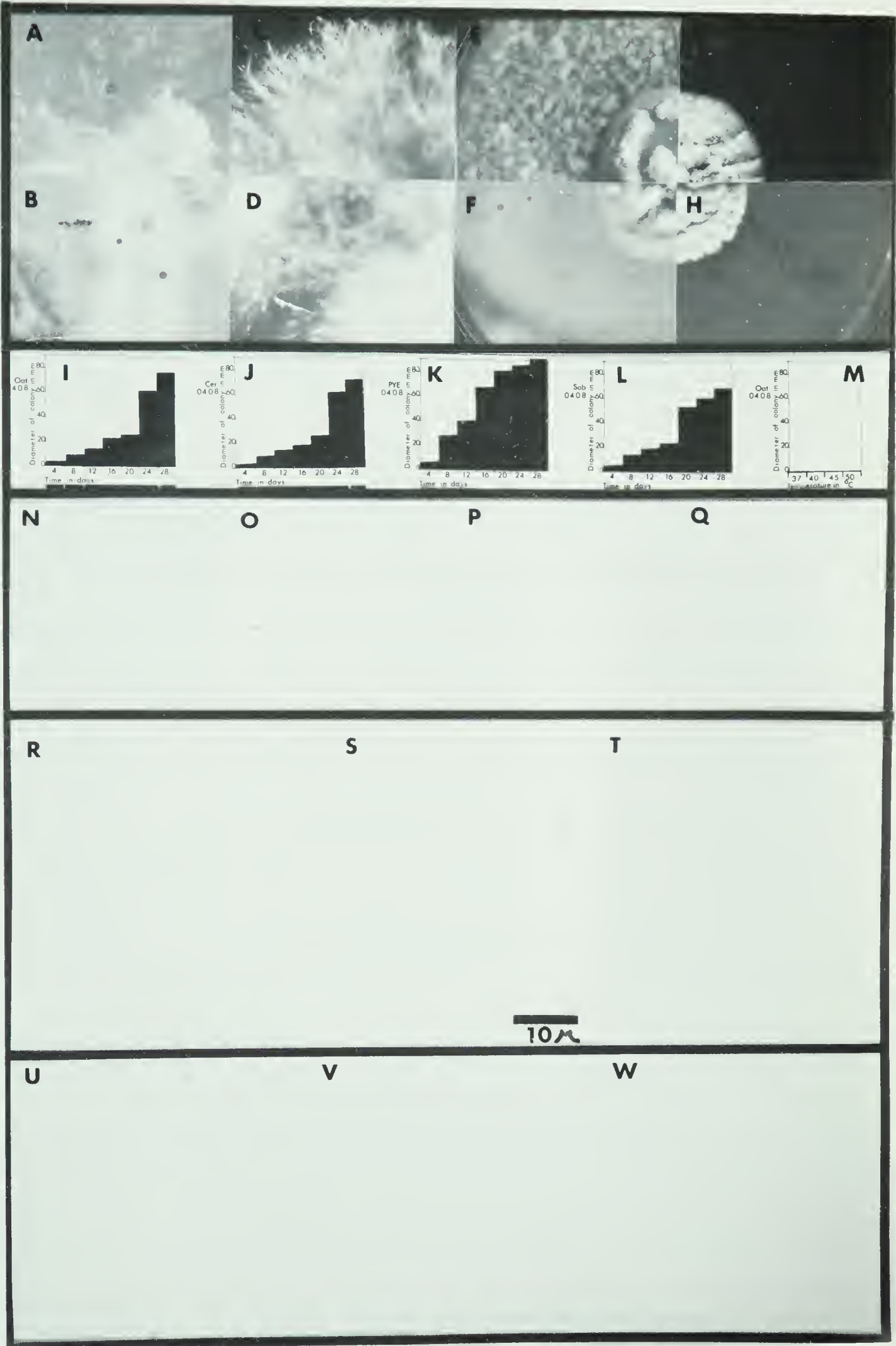


Plate #55: *Microascus manginii* UAMH 2642

Isolated from chicken litter, Guelph, 1966 by G. Barron

Received 1966 from Barron as *Microascus manginii* 10490

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Off white/light
 - 2) Cer- Lt. slimy grey center rest lt. grey/none
 - 3) PYE- Lt. grey/gold
 - 4) Sab- White/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6.5-8.5 x 5-8 μ m Figs. N,R
- b. Synnematus conidia- not seen Figs. O,S
- c. Ascocarps- 161-232.5 μ m dia. Figs. P,U
- d. Ascospores- 4.5-6 x 3-4 μ m, red Figs. Q,T,V,W

4. Comments

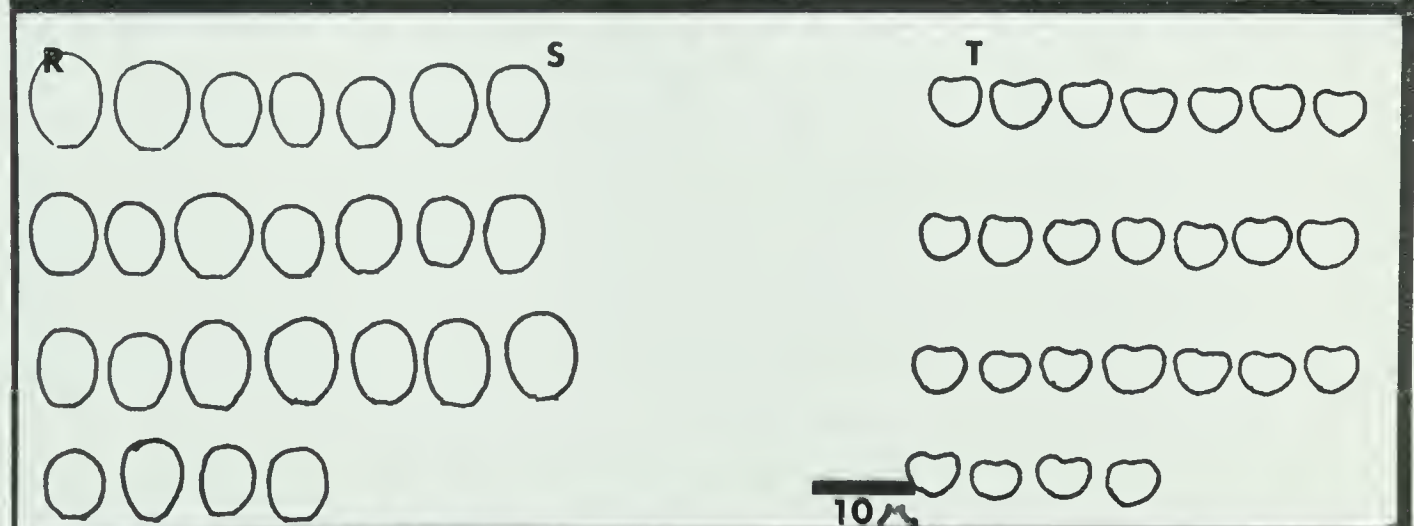
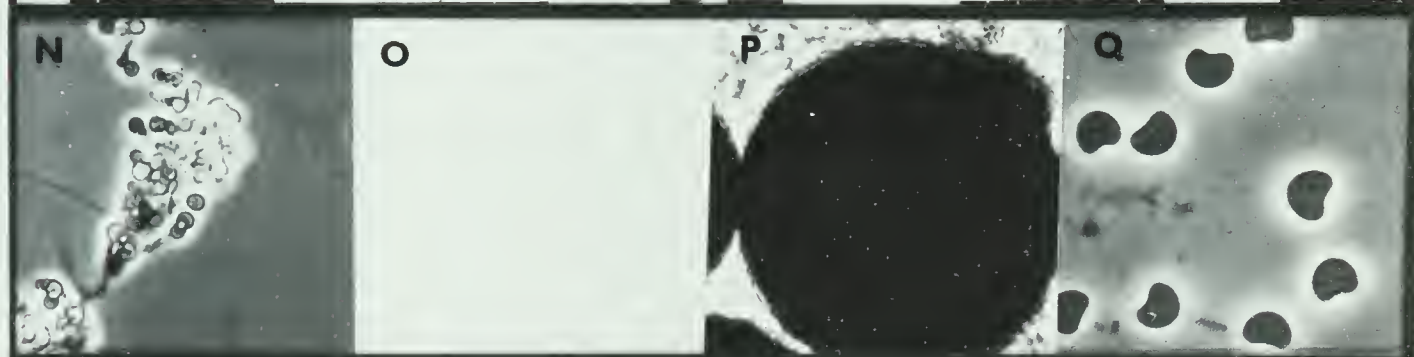
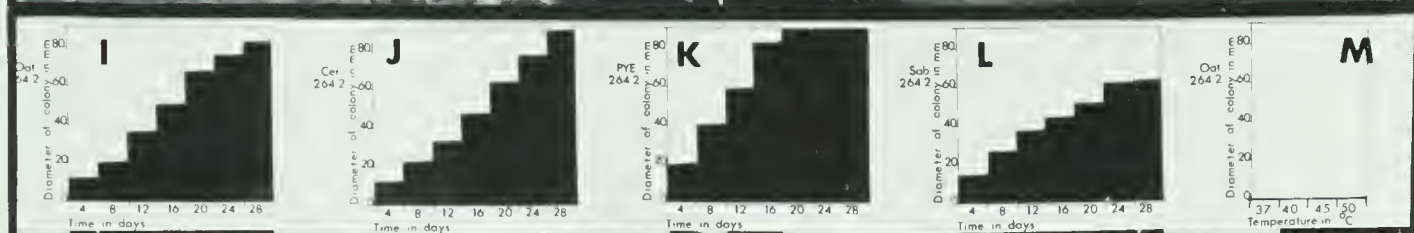
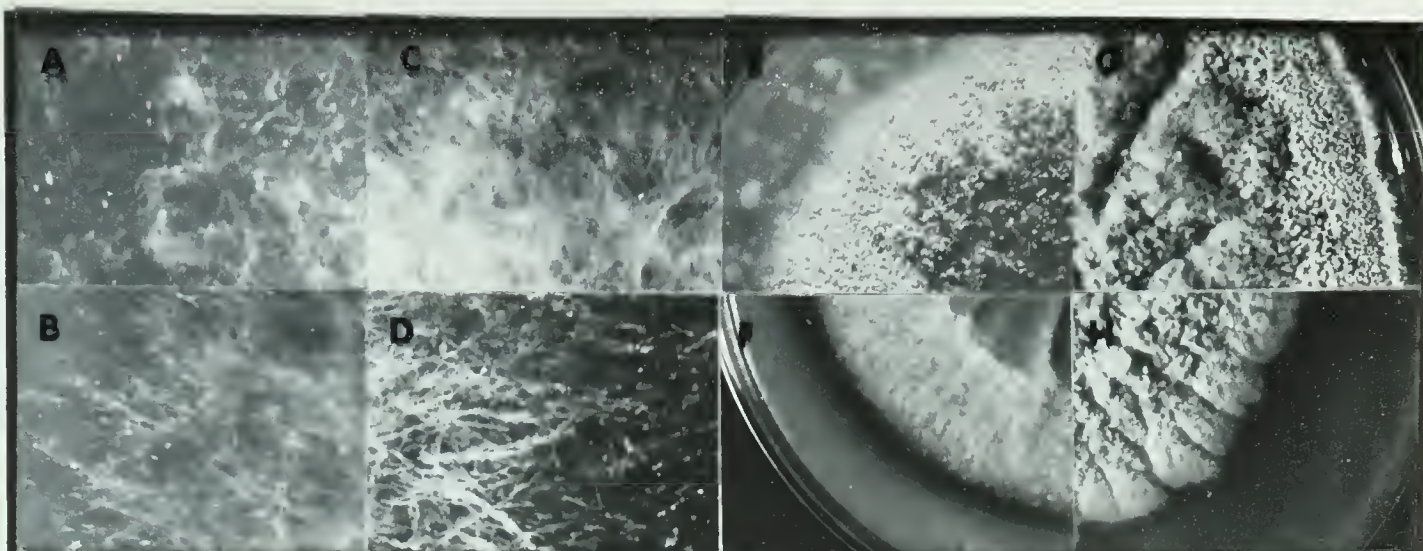


Plate #56: *Microascus singularis* UAMH 2637

Isolated 1966 by G. Barron

Received 1966 from Barron as *Microascus doguetti* 10484

1. Colonies

- | | | |
|----|-------------------------------------|-----------|
| a. | 4 days on Oat Cer PYE and Sab | Figs. A-D |
| b. | 21 days on Oat Cer PYE and Sab | Figs. E-H |
| c. | Colour at 28 days (Surface/Reverse) | |
| | 1) Oat- Cream/light | |
| | 2) Cer- Off white/none | |
| | 3) PYE- Cream green/gold brown | |
| | 4) Sab- Cream/cream | |

2. Growth Rates

- | | | |
|----|----------------------------------|-----------|
| a. | at 25°C on different media | Figs. I-L |
| b. | at different temperatures on Oat | Fig. M |

3. Microscopic Characters

- | | | |
|----|--|---------------|
| a. | Diffuse conidia- 4.5-6 x 2.5-3.5 μ m | Figs. N,R |
| b. | Synnematous conidia- not seen | Figs. O,S |
| c. | Ascocarps- measurement not available | Figs. P,U |
| d. | Ascospores- 4.5-6 x 3-5 μ m, red | Figs. Q,T,V,W |

4. Comments

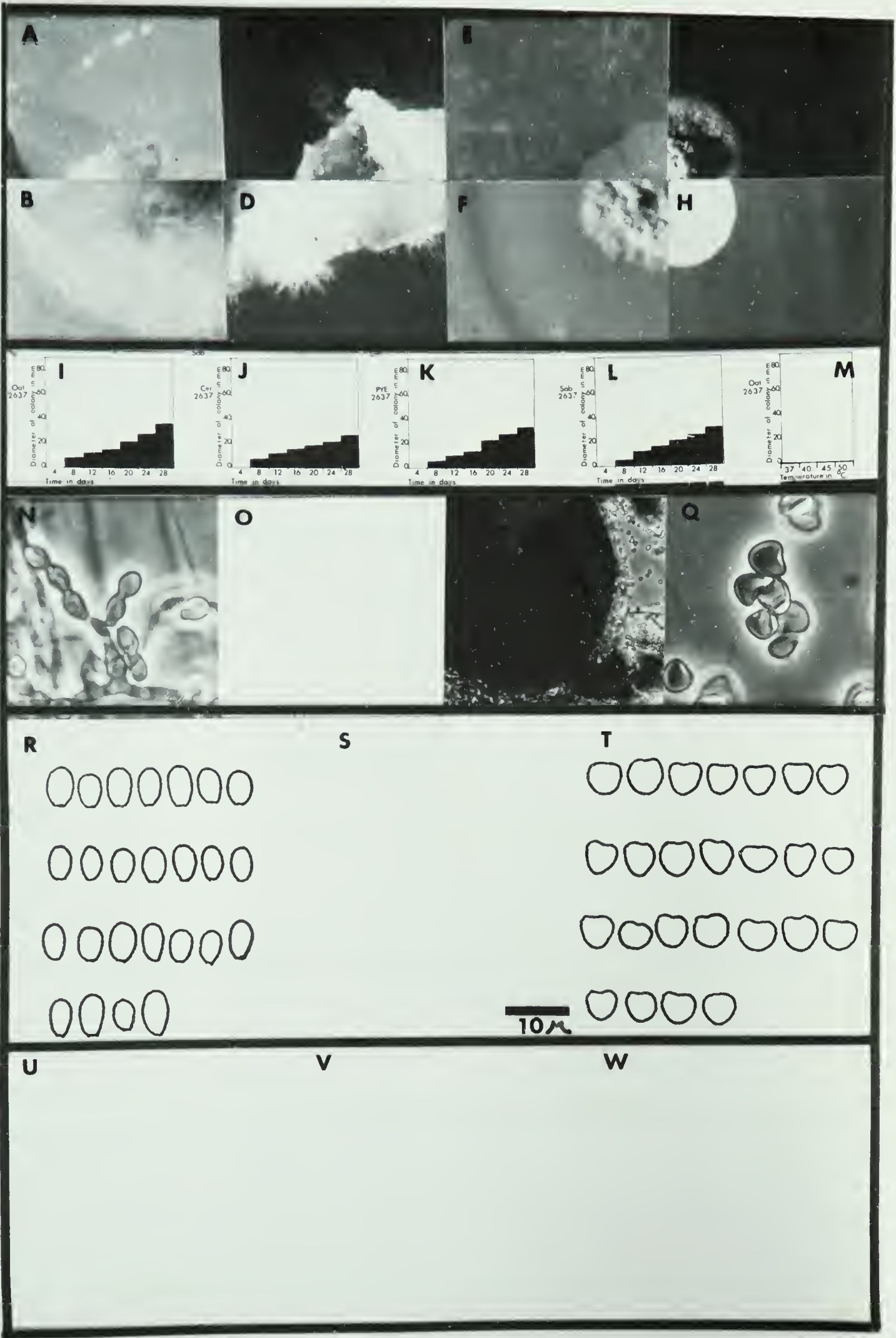




Plate #57: *Microascus trigonosporus* UAMH 655

Isolated

Received 1959 from CBS as *Microascus trigonosporus* CBS
strain Whitehead 3

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Cream/light
 - 2) Cer- Lt. grey/none
 - 3) PYE- Cream/cream gold
 - 4) Sab- Cream/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 3.5-5 x 2-2.5 μ m Figs. N,R
- b. Synnematos conidia- not seen Figs. O,S
- c. Ascocarps- measurement not available Figs. P,U
- d. Ascospores- 4-5.5 x 3-4 μ m, red Figs. Q,T,V,W

4. Comments

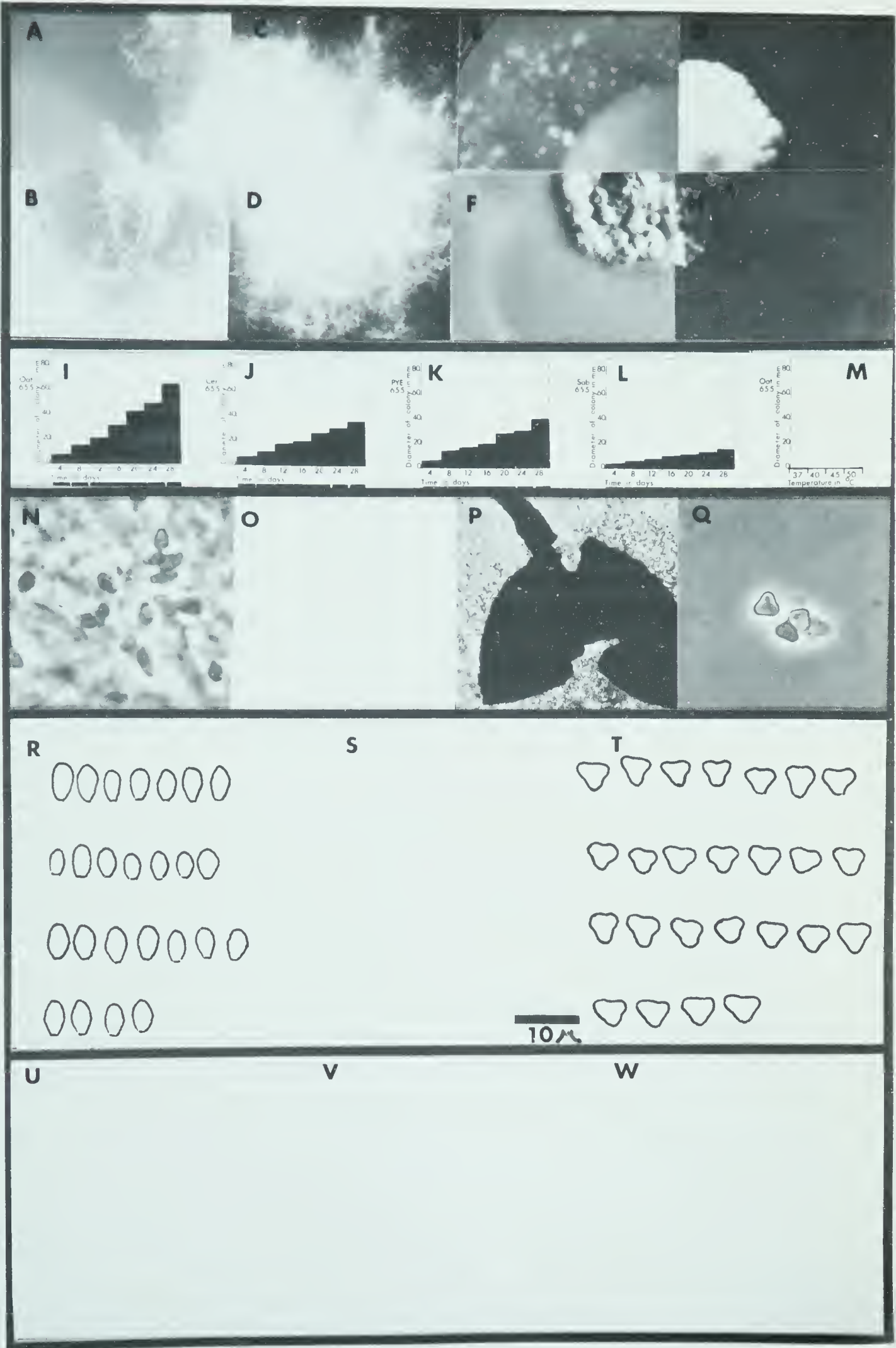


Plate #58: *Kernia nitida* UAMH 3060

Isolated 1954 by R. K. Benjamin

Received 1969 from Benjamin as *Kernia brachytricha*

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Cream/light
 - 2) Cer- Mod. grey/none
 - 3) PYE- Lt. cream green/gold
 - 4) Sab- Lt. grey/gold green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- not seen Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- 86-118.5 μ m dia. Figs. P,U
- d. Ascospores- 4-5 x 2-3 μ m, golden Figs. Q,T,V,W

4. Comments

Malloch (1971) reclassified the species *K. brachytricha* to be a synonym of *K. nitida*.

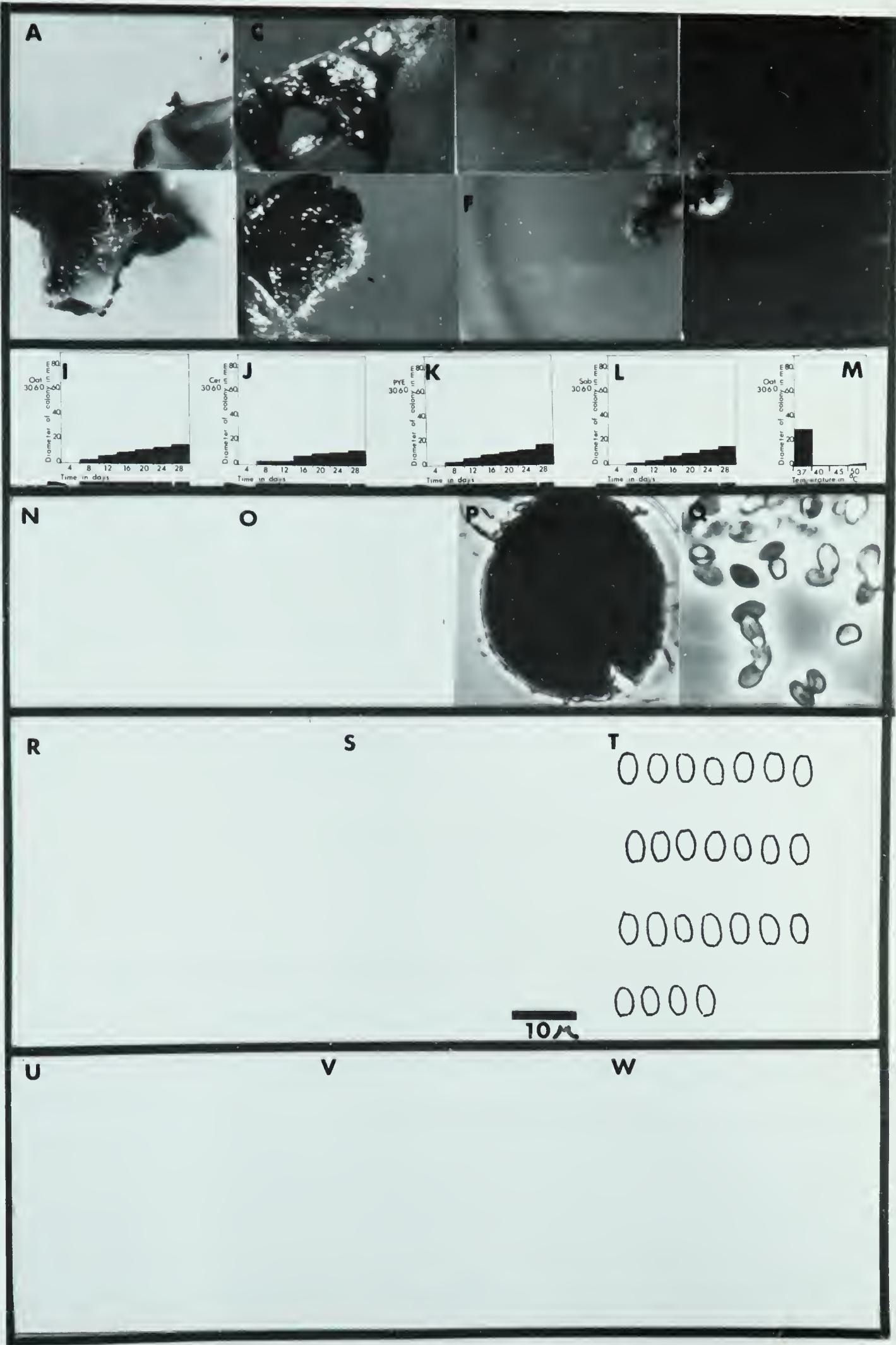


Plate #59: *Lophotrichus ampullus* UAMH 1762

Isolated from dung, 1949 by Anastasiou

Received 1963 from Anastasiou as *Lophotrichus ampullus*

Benj. 779

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark grey/mod.dark
 - 2) Cer- Dark mouse brown/none
 - 3) PYE- Mod. grey/dark olive green
 - 4) Sab- Dark olive green/dark olive green

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- not seen Figs. N,R
- b. Synnemalous conidia-not seen Figs. O,S
- c. Ascocarps- 170.5-231.5 μ m dia. Figs. P,U
- d. Ascospores- 9-12.5 x 6.5-7.5 μ m, golden Figs. Q,T,V,W

4. Comments

Fig. P illustrates the long beak and the hairs on the ascocarp.

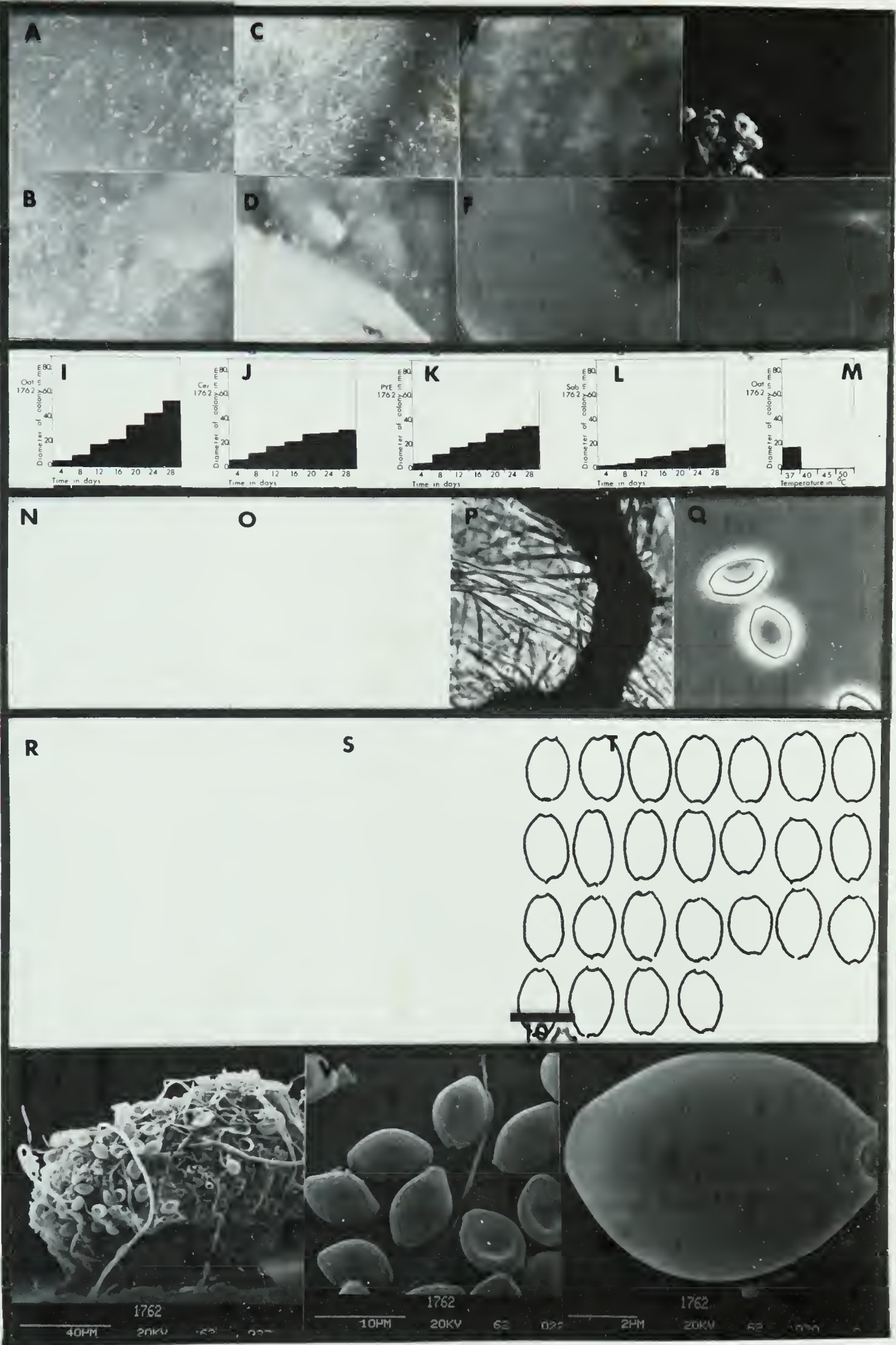


Plate #60: *Faurelina elongata* UAMH 4232

Isolated from goat dung by K. G. Mukerji

Received 1979 from CBS as *Faurelina elongata* CBS 126.78

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Dark/lt.
 - 2) Cer- Dark brown/none
 - 3) PYE- Cream lt. gold/tan
 - 4) Sab- Lt. cream green/cream

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 6.5-17.5 x 3.5-6.5 μ m Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- measurement not available Figs. P,U
- d. Ascospores- 4.5-7 x 2.5-4.5 μ m, golden Figs. Q,T,V,W

4. Comments

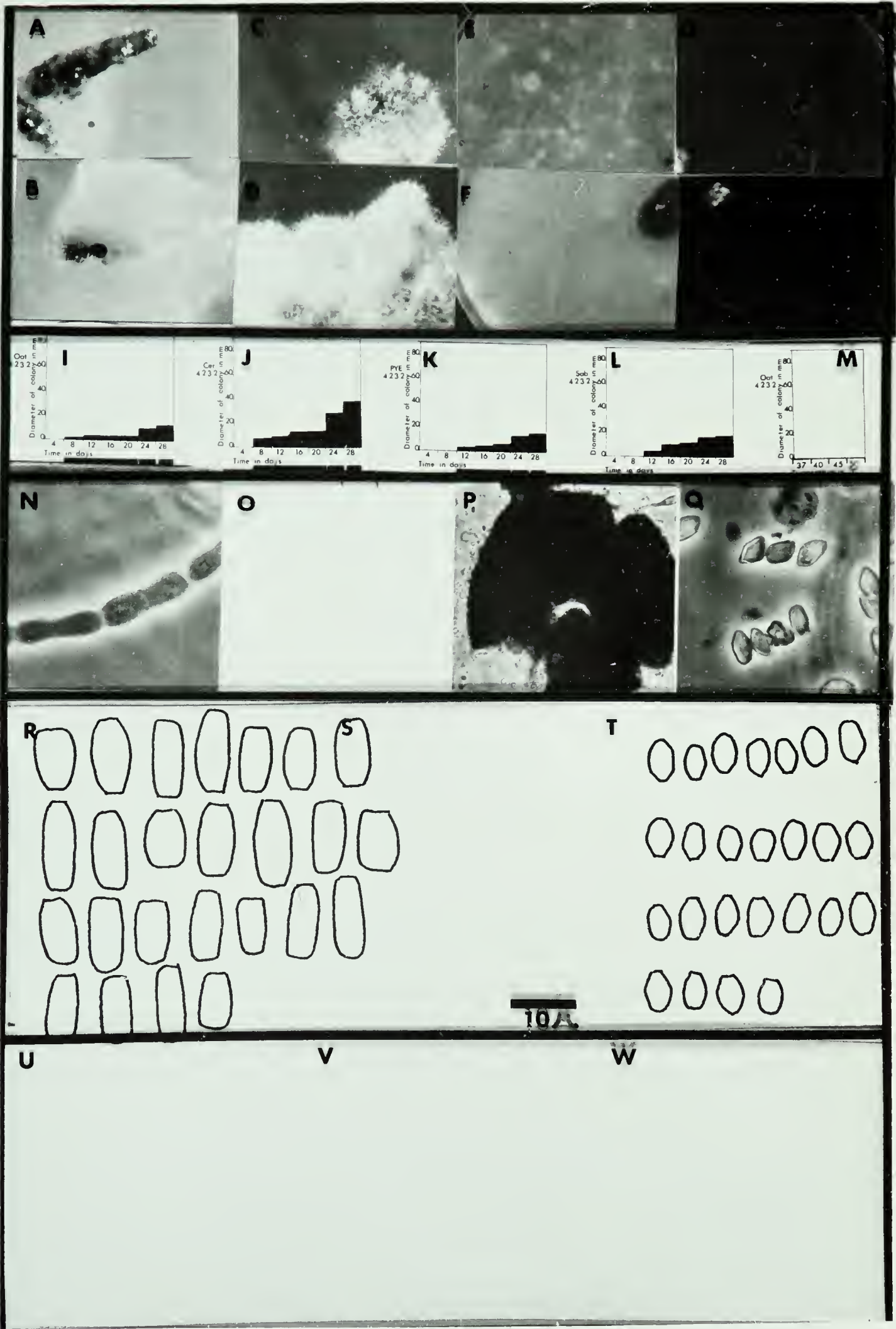


Plate #61: *Pithoascus langeronii* UAMH 4234

Isolated as a contaminant in *Petriellidium fimeti*
culture, Netherlands, 1978 by von Arx

Received 1979 from CBS as *Pithoascus langeronii* CBS
203.78

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- White/light
 - 2) Cer- Cream tan/none
 - 3) PYE- White/cream yellow
 - 4) Sab- Pale cream yellow/yellow gold

2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- 2.5-7.5 x 1-2 μ m Figs. N,R
- b. Chlamydospores- 3-5.5 x 2-3.5 μ m Figs. O,S
- c. Ascocarps- 74.5-91.5 μ m dia. Figs. P,U
- d. Ascospores- measurements not available Figs. Q,T,V,W

4. Comments

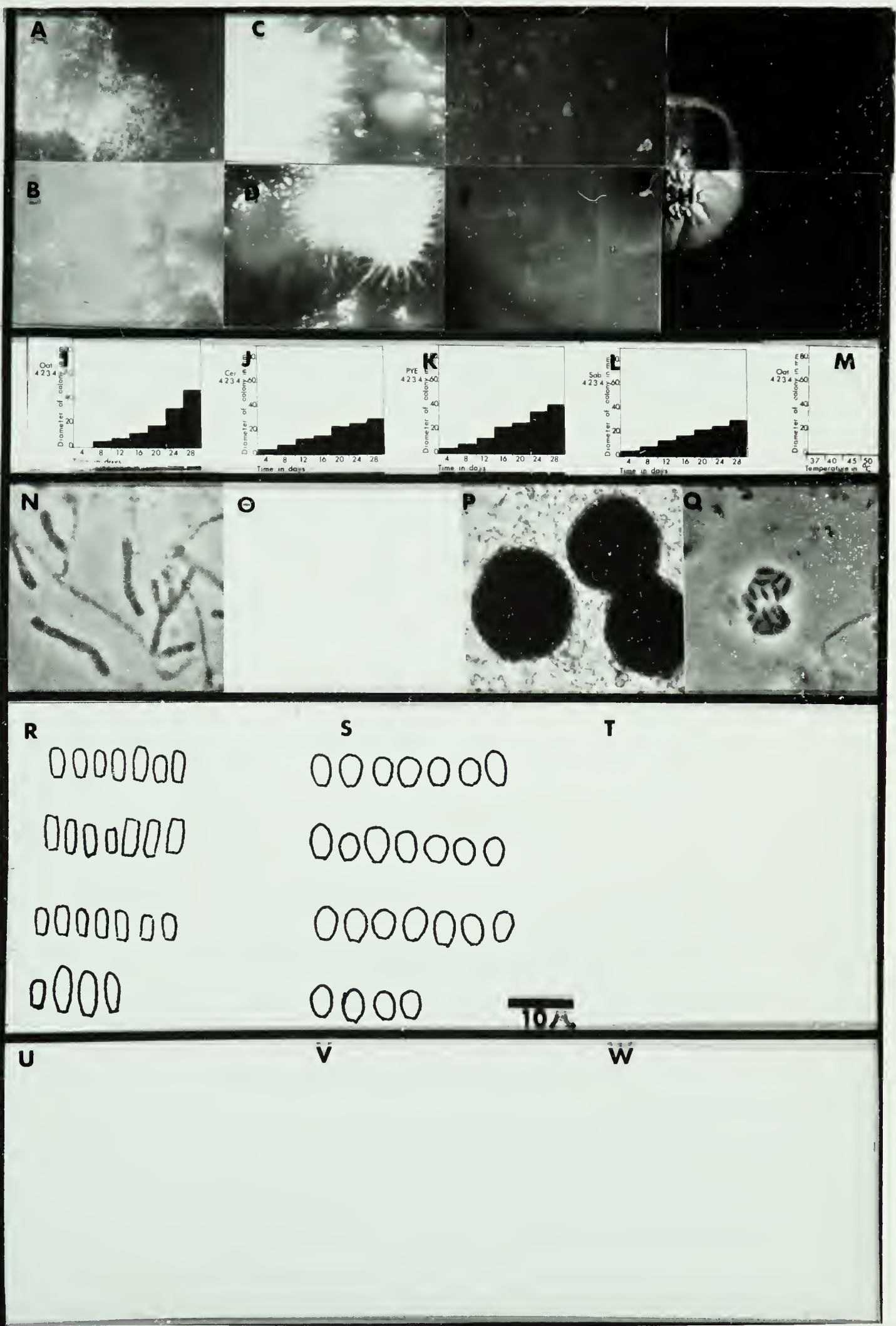


Plate #62: *Thielavia terricola* UAMH 1918

Isolated from soil, Japan, 1958 by Udagawa

Received 1964 from Emmons as *Thielavia terricola*

NHL 2269

1. Colonies

- a. 4 days on Oat Cer PYE and Sab Figs. A-D
- b. 21 days on Oat Cer PYE and Sab Figs. E-H
- c. Colour at 28 days (Surface/Reverse)
 - 1) Oat- Off white/light
 - 2) Cer- Off white/none
 - 3) PYE- White/yellow
 - 4) Sab- Off white/gold

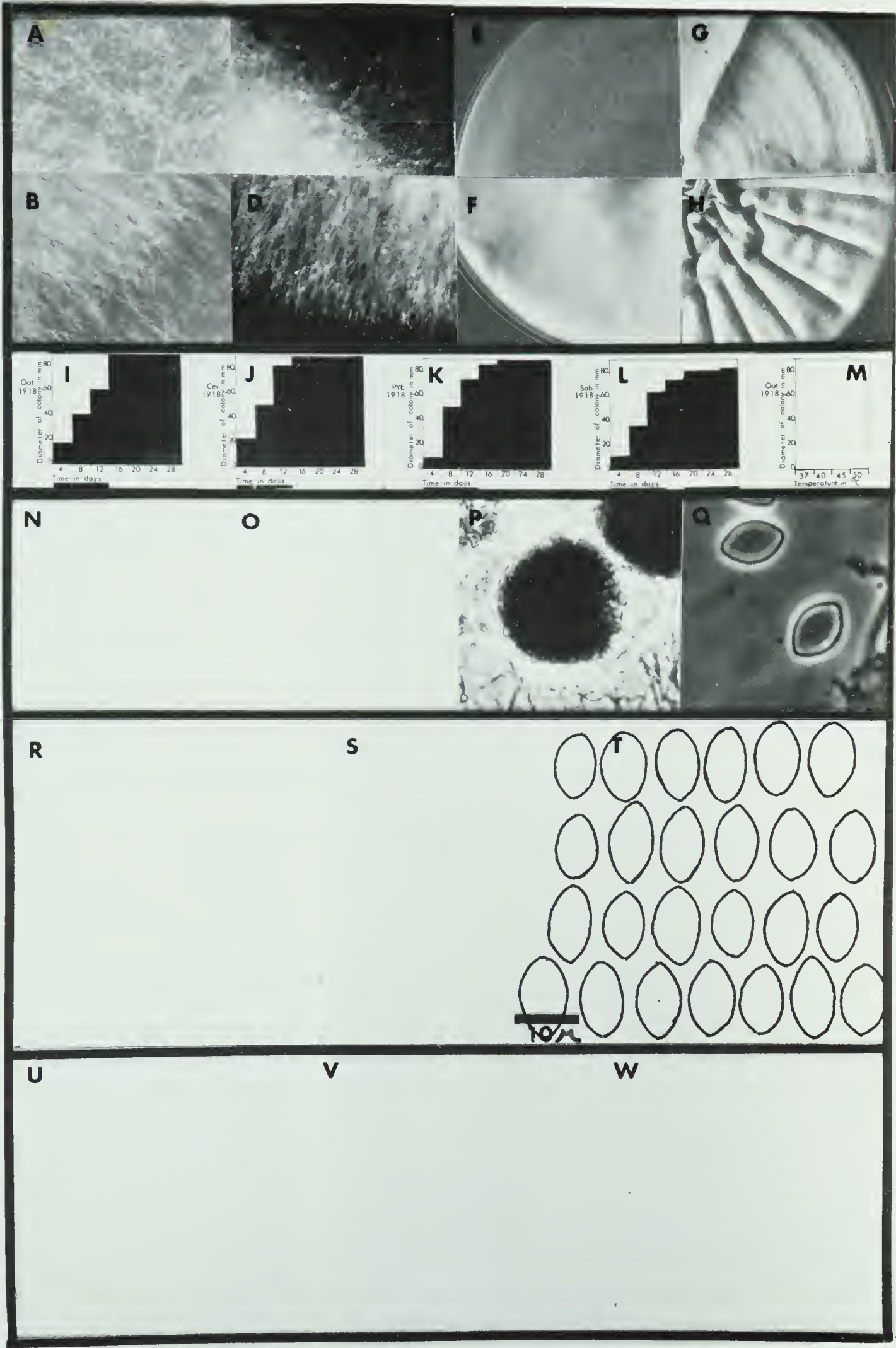
2. Growth Rates

- a. at 25°C on different media Figs. I-L
- b. at different temperatures on Oat Fig. M

3. Microscopic Characters

- a. Diffuse conidia- not seen Figs. N,R
- b. Synnemalous conidia- not seen Figs. O,S
- c. Ascocarps- 70-128 μ m dia. Figs. P,U
- d. Ascospores- 10-14.5 x 7-8.5 μ m, brown Figs. Q,T,V,W

4. Comments



The illustrations were compiled in this format for convenience. Comparison of the strains of *P. boydii*, comparison of *P. boydii* to other species of *Petriellidium* and species of the other genera included in the Microascaceae and Pithoascaceae could be easily made.

G. Results of TAXMAP analyses

The first analysis, using all attributes for all 67 strains yielded inconclusive results due to the numerous cases where attribute values could not be scored because the structures were missing. For example, ascospore and ascocarp characters could not be scored for 31 strains which did not produce ascomata. Therefore the attributes were split into three groups: 1) vegetative growth attributes which were applicable to all strains, 2) conidial attributes which were applicable to most strains and 3) ascospore attributes which were applicable to about half of the strains. Then the relations among the strains were analysed in four separate groups: 1), all of the strains were compared on their vegetative and conidial attributes; 2), the *Petrieiellidium* strains alone were compared on their vegetative and conidial attributes; 3), all ascospore-producing strains were compared on their vegetative and ascospore attributes; 4), the *Petrieiellidium* ascospore-producing strains were compared on their vegetative and ascospore attributes. The only available strain of *P. africanum* (UAMH 4000) was included in the third and fourth analysis, even though it has not produced ascospores since it was received at UAMH. For each of the four analyses, two sets of results are presented, the first based on differentially weighted attributes, the second on equally weighted attributes (see page 23). In general, the differentially weighted analyses produced the most useful results, but since there is still no general

agreement on weighting, both are presented and compared.

The results of each analysis are represented first in the form of a table showing the cluster membership and some statistics pertaining to the clusters and then in the form of a taxometric map (Carmichael and Sneath 1969)

illustrating the relationships among the clusters given in the table. The clusters are positioned on the map by triangulation from this and two nearest neighbours. The diameter of the circles in the maps represents the distance between the two most distant OTU's in the cluster. The number of OTU's in the cluster is not represented graphically, but can be seen in the tables. The straight lines represent undistorted distances between clusters, or between isolated OTU's. The points followed by a number represent isolated OTU's which are treated as clusters with no variation and the arrows indicate nearest neighbours (Carmichael and Sneath 1969).

1) Comparison of all strains on conidial and vegetative attributes

a) Results of analysis with differential weighting.

Table 5 and Figure 11

The largest cluster (#2) included 36 of the 38 *P. boydii* strains along with *P. fusoidium*, *P. angustum*, and *P. ellipsoideum*. The other two *P. boydii* strains, UAMH 2324 and UAMH 3749, and the remaining *Petriellidium* species were clustered as isolated points. The isolated *P. boydii* strains clusters 7 and 8 were nearest neighbours to each other and

to cluster #2. The reasons these two strains were isolated from the rest of the *P. boydii* strains was UAMH 2324 had a "sickly" appearance and growth and UAMH 3749 had a slow growth rate.

The *Petriella* strains were grouped into two clusters and an isolated strain. The first cluster contained the *Pe. sordida* strains plus *Pe. guttulata* and one of the four *Pe. setifera* strains. The second cluster included two *Pe. setifera* strains and *Pe. lindforsii*. The isolated cluster was a *Pe. setifera* strain.

The *Microascus* strains were mostly separated into isolated points. None clustered with another member of *Microascus*. *M. desmosporus* (wood isolate) was grouped with *Lophotrichus*. *M. longirostris* was grouped with *Thielavia* and *M. intermedius* with *Kernia* probably due to the lack of a conidial state.

The *Pithoascaceae* strains *Faurelina* and *Pithoascus* were clustered as isolated points.

It is noteworthy that in this analysis based on vegetative and conidial characters, the *Petrieiellidium* strains were nearest neighbours to each other except for *P. fimeti* and *P. africanum*.

1) Comparison of all strains on conidial and vegetative attributes. a) Results of analysis with differential weighting.

(MINIMUM NUCLEUS 0.122. MAXIMUM DROP 0.0457 BOTH ARE 100% OF NORMAL)

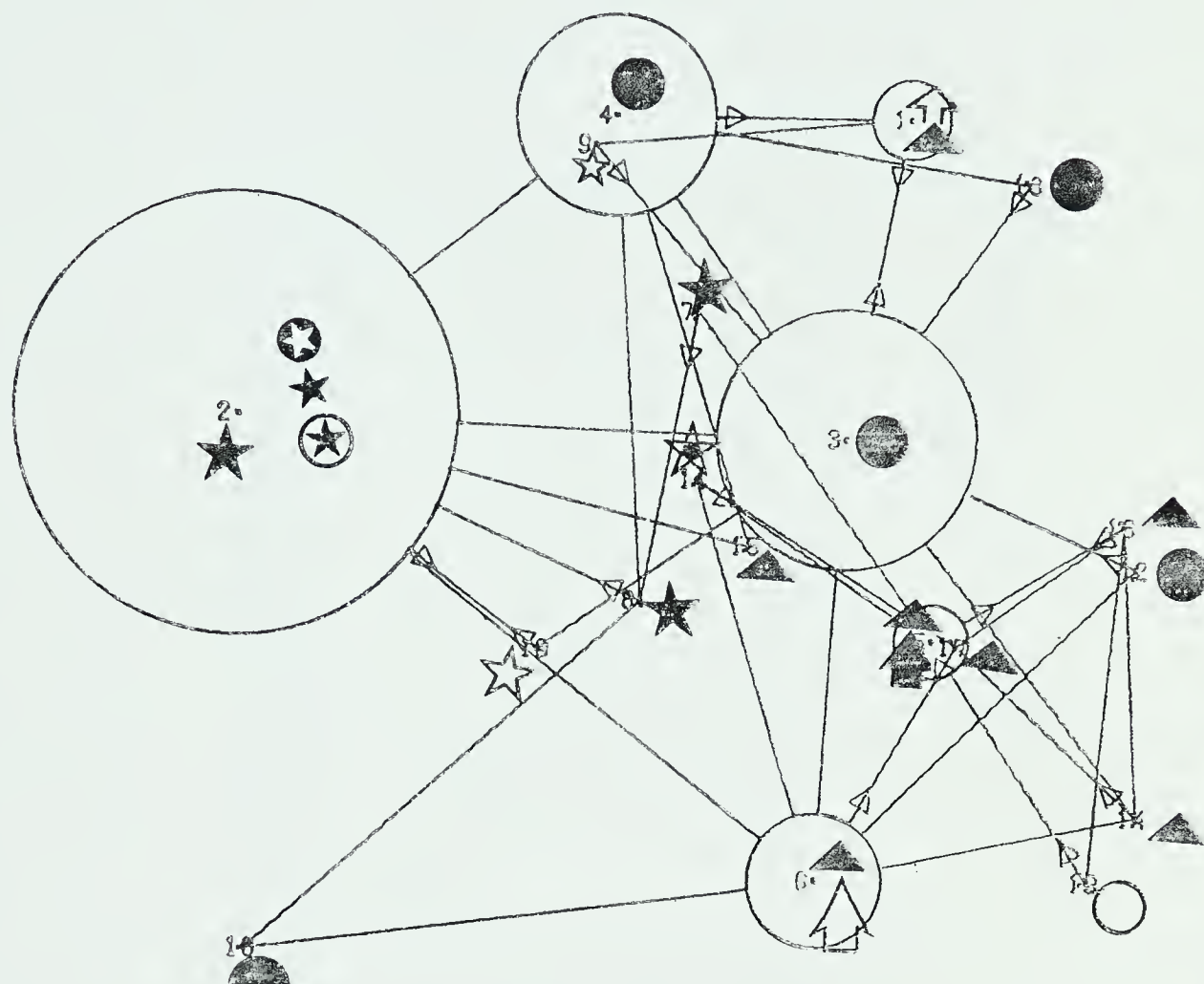
1	66					TBA43055
	67 0.0					TTE19185
	58 0.04	59 0.047 0.047	55 0.05			MLO0408F
	46 0.10	66 0.160 0.112	58 0.21	1000	PL13995U	
2	28					P804238P
	29 0.0					P804248P
	19 0.11	28 0.105 0.105	29 0.11			P803904P
	4 0.03	19 0.083 0.022	29 0.11			P801095P
	3 0.03	4 0.084 0.001	28 0.13			P800800N
	31 0.04	3 0.098 0.014	28 0.16			P804302P
	25 0.06	8 0.094 0.003	29 0.15			P803873P
	10 0.03	35 0.106 0.011	28 0.18			P802507N
	13 0.02	10 0.093 0.013	28 0.17			P803239M
	6 0.03	13 0.109 0.016	29 0.20			P801101E
	44 0.05	19 0.107 0.001	5 0.16			PFU3997M
	30 0.05	31 0.112 0.004	29 0.20			P804301P
	12 0.05	44 0.110 0.001	5 0.18			P803230M
	24 0.05	35 0.099 0.012	29 0.16			P8039915
	22 0.03	24 0.095 0.004	28 0.17			P803982P
	2 0.05	13 0.128 0.033	29 0.21			P806153N
	23 0.04	2 0.124 0.004	29 0.20			P803990A
	1 0.05	2 0.122 0.002	26 0.22			P800002P
	6 0.02	1 0.125 0.003	29 0.23			P801265P
	17 0.05	1 0.126 0.001	29 0.21			P803872M
	7 0.02	17 0.131 0.008	28 0.23			P801865N
	34 0.06	84 0.123 0.009	5 0.18			P804310P
	27 0.03	34 0.111 0.012	29 0.17			P804218P
	8 0.04	27 0.102 0.009	29 0.18			P802217P
	32 0.02	8 0.104 0.002	28 0.17			P804303P
	14 0.04	27 0.130 0.026	29 0.20			P803746M
	23 0.04	14 0.127 0.003	29 0.22			P804304P
	18 0.05	34 0.110 0.016	5 0.17			P803873M
	16 0.06	2 0.144 0.033	29 0.25			P803750M
	25 0.06	5 0.124 0.020	28 0.24			P8039925
	36 0.06	34 0.113 0.011	28 0.21			P80521FS
	26 0.07	24 0.148 0.035	28 0.23			P8039955
	40 0.01	26 0.153 0.005	28 0.24			PAN3984M
	21 0.07	19 0.151 0.002	16 0.23			P803981P
	37 0.07	36 0.165 0.014	26 0.29			P805220M
	38 0.06	37 0.153 0.012	40 0.23			P80522LD
	20 0.08	18 0.170 0.017	40 0.28			P803905P
	11 0.10	20 0.159 0.011	37 0.23			P802875P
	42 0.04	11 0.151 0.008	5 0.22			P8L39875
	41 0.11	40 0.245 0.095	20 0.39	1000	P0E38935	
3	53					PS03983U
	54 0.02					PS039855
	52 0.10	54 0.098 0.082	53 0.19			PS01410U
	45 0.11	54 0.118 0.018	52 0.12			PGU3996K
	48 0.09	45 0.146 0.028	53 0.17			PSE0405U
	65 0.10	45 0.227 0.063	52 0.20	1004	TBA4395F	
4	49					PSE1862E
	60 0.03					PSE19245
	46 0.10	50 0.114 0.082	49 0.13			PL13998U

ISOLATED OTU'S (SINGLE MEMBER CLUSTERS)

CLUSTER	OTU	LABEL
7	9	P802324P
8	16	P603749H
9	39	PAF4000S
10	41	PDE3393S
11	43	PF14267M
12	47	PMU3366W
13	51	PSE2702S
14	56	MOE0966U
15	59	MMA2642M
16	60	MS12637U
17	61	MTR0655U
18	62	FEL4232M
19	65	PLA4234C

Fig. 11

Taxometric map for comparison of all strains on conidial and vegetative attributes, differential weighting.



- ☆ Petriellidium africanum
- ★ Petriellidium angustum
- ★ Petriellidium boydii
- ☆ Petriellidium desertorum
- ⊗ Petriellidium ellipsoideum
- ★ Petriellidium fimeti
- ⊗ Petriellidium fusoideum

- ▲ Kernia
- ▲ Lophotrichus
- ▲ Microascus
- Petriella
- ◐ Faurelina
- Pithoascus
- ⬆ Thielavia

Table 6

1) Comparison of all strains on conidial and vegetative attributes. b) Results of analysis with equal weighting.

MAP CLUSTER ANALYSIS: -ALL SPECIES CONIDIAL CHARACTERS

(MINIMUM NUCLEUS 0.148, MAXIMUM DROP 0.0498 BOTH ARE 100% OF NORMAL)
EQUALLY WEIGHTED ATTRIBUTES

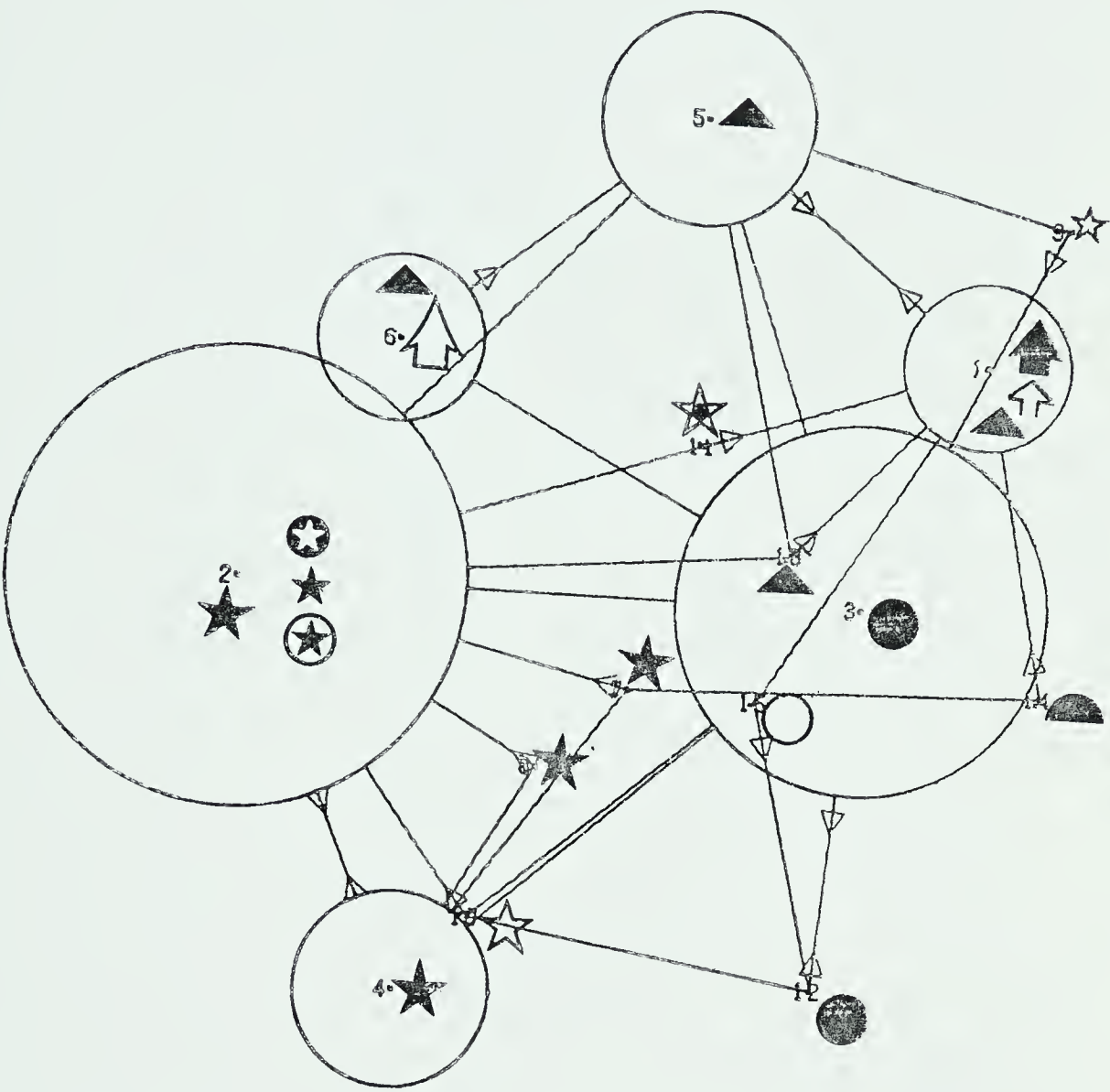
CLUS NO.	OTU NOS	DIST LINK	OTU BEST LINK	AVG OF NEW LINKS	DROP IN AVG.	FAR OTU FAR	DIST OTU	FLAG	NAME OF OTU
-------------	------------	--------------	---------------------	------------------------	--------------------	-------------------	-------------	------	-------------

1	66								TBA43055
	67 0.0								TTE19185
	58 0.02		67 0.021	0.021		66 0.02			ML00408P
	57 0.08		58 0.095	0.075		66 0.11			MIN2469P
	63 0.04		57 0.101	0.005		67 0.13			KBR3060U
	60 0.15		57 0.188	0.087		66 0.23	1000		MS12637U
2	28								PB04738P
	28 0.0								PB04248P
	4 0.13		28 0.128	0.128		28 0.13			PB01099P
	3 0.02		4 0.106	0.022		28 0.15			PB00800N
	19 0.03		4 0.083	0.023		28 0.13			PB03904P
	31 0.04		3 0.101	0.018		29 0.17			PB04302P
	44 0.06		19 0.101	0.009		28 0.17			PFU3997M
	12 0.05		44 0.094	0.007		28 0.16			PB03230M
	21 0.08		19 0.120	0.026		29 0.16			PB03981P
	35 0.08		4 0.137	0.017		29 0.20			PB03973P
	10 0.03		35 0.145	0.008		28 0.23			PB02507N
	13 0.03		10 0.133	0.012		28 0.22			PB03739M
	5 0.03		13 0.146	0.013		28 0.25			PB011016
	24 0.08		35 0.135	0.010		28 0.21			PB03991S
	22 0.03		24 0.128	0.007		28 0.21			PB03982P
	30 0.06		24 0.140	0.012		28 0.25			PB04301P
	26 0.07		30 0.172	0.032		29 0.29			PB03595S
	40 0.01		26 0.172	0.000		28 0.30			PAN3964H
	2 0.06		13 0.186	0.024		28 0.29			PB00153N
	16 0.03		2 0.201	0.005		29 0.30			PB03750M
	23 0.04		2 0.184	0.018		28 0.29			PB03990A
	36 0.07		23 0.180	0.004		28 0.30			PB0521FS
	37 0.07		36 0.221	0.041		29 0.37			PB05220H
	38 0.06		37 0.197	0.023		28 0.30			PB052210
	1 0.08		2 0.177	0.020		29 0.30			PB00002P
	6 0.02		1 0.175	0.002		28 0.30			PB01265P
	17 0.06		1 0.171	0.004		29 0.29			PB03872M
	7 0.02		17 0.174	0.003		28 0.31			PB01865N
	25 0.06		6 0.170	0.004		28 0.32			PB03992S
	42 0.05		25 0.188	0.019		5 0.27			FEL3987S
	11 0.05		42 0.189	0.000		44 0.26			PB02975P
	14 0.09		36 0.168	0.020		5 0.26	50		PB03746M
3	53								P503983U
	54 0.02								P503985S
	52 0.10		54 0.107	0.086		53 0.11			P501410U
	45 0.09		52 0.124	0.018		53 0.15			PGU3996M
	46 0.11		45 0.166	0.040		53 0.21			PLJ3999U
	48 0.13		45 0.170	0.006		53 0.22			P5E6805U
	51 0.13		54 0.202	0.032		46 0.30			P5E2702S
	50 0.14		48 0.195	0.007		52 0.24			P5E1924S
	49 0.03		50 0.175	0.019		48 0.24			P5E1662C
	47 0.18		52 0.270	0.094		51 0.35	1200		PMU3986W
4	8								PB02217P
	32 0.02								PB04303P
	27 0.03		8 0.046	0.022		32 0.06			PB04218P
	14 0.03		27 0.047	0.002		32 0.06			PB03746M
	34 0.07		27 0.040	0.007		8 0.05			PB04310P
	33 0.03		32 0.051	0.011		27 0.03			PB04304P
	18 0.05		32 0.065	0.015		33 0.03			PB03873N
	20 0.07		18 0.127	0.061		33 0.15			PB03905P
	35 0.09		14 0.123	0.008		29 0.20	4		PB0521FS
	LINK TO CLUSTER -2								
5	60								MS12637U
	61 0.11								MTRO655U
	56 0.13		61 0.148	0.037		60 0.17			M0E0966U
	57 0.15		60 0.242	0.093		56 0.34	1004		MIN2469P
6	65								MS36WIDE
	64 0.13								LAM1762U
	61 0.15		55 0.250	0.117		64 0.35	1004		MTRO655U

ISOLATED OTU'S (SINGLE MEMBER CLUSTERS)

CLUSTER	OTU	LABEL
7	8	PB02324P
8	15	PB03749M
9	39	PAF4000S
10	41	P0E3993S
11	43	PF14257M
12	47	PMU3986W
13	69	MMA2642M
14	62	FEL4232M
15	65	PLA4234C

Fig. 12
Taxometric map for comparison of all strains on conidial and vegetative attributes, equal weighting.



- | | |
|-------------------------------------|-----------------------|
| ☆ <u>Petriellidium africanum</u> | ▲ <u>Kernia</u> |
| ★ <u>Petriellidium angustum</u> | ▲ <u>Lophotrichus</u> |
| ★ <u>Petriellidium boydii</u> | ▲ <u>Microascus</u> |
| ☆ <u>Petriellidium desertorum</u> | ● <u>Petriella</u> |
| ⊗ <u>Petriellidium ellipsoideum</u> | ◐ <u>Faurelina</u> |
| ★ <u>Petriellidium fimeti</u> | ○ <u>Pithoascus</u> |
| ⊗ <u>Petriellidium fusoides</u> | |
| | ⬆ <u>Thielavia</u> |

2) Comparison of *Petriellidium* strains on conidial and vegetative attributes. a) Results of analysis with differential weighting.

(MINIMUM NUCLEUS 0.112. MAXIMUM DROP 0.0334 BOTH ARE 100% OF NORMAL)

1	24					PB04238P
	29 0.0					PB04248P
	19 0.12	28 0.123	0.123	28 0.12	1200	PB03904P
2	26					PB03995S
	40 0.01					PAN3984M
	25 0.08	26 0.088	0.073	40 0.08		PB03992S
	6 0.08	25 0.141	0.053	40 0.18	1000	PB01265P
3	8					PB02217P
	32 0.03					PB04303P
	27 0.05	8 0.060	0.034	32 0.07		PB04218P
	34 0.06	27 0.056	0.007	8 0.07		PB04310P
	14 0.05	27 0.074	0.020	32 0.10		PB0374CM
	33 0.06	14 0.077	0.002	27 0.11		PB04304P
	44 0.07	34 0.115	0.038	33 0.15	1000	PFU3997M
4	1					PB00002P
	6 0.03					PB01265P
	2 0.06	1 0.071	0.043	6 0.08		PB00153N
	23 0.06	2 0.097	0.027	6 0.13		PB03990A
	13 0.06	2 0.100	0.003	6 0.12		PB03239M
	10 0.03	13 0.094	0.007	6 0.13		PB02507N
	5 0.04	13 0.096	0.002	6 0.16		PB01101B
	35 0.04	10 0.088	0.008	6 0.14		PB03973P
	4 0.06	35 0.114	0.026	6 0.15		PB01099P
	3 0.03	4 0.118	0.004	2 0.16		PB00300N
	19 0.04	4 0.117	0.001	6 0.18		PB03904P
	31 0.06	3 0.118	0.001	23 0.19		PB04302P
	24 0.06	35 0.107	0.011	2 0.16		PB03991S
	22 0.04	24 0.099	0.008	2 0.14		PB03982P
	30 0.06	31 0.115	0.017	23 0.19		PB04301P
	44 0.07	19 0.152	0.037	1 0.22	1000	PFU3997M
5	7					PB01865N
	17 0.03					PB03872M
	1 0.07	17 0.072	0.042	7 0.07	4	PB00002P
	LINK TO CLUSTER -4					
6	11					PB02975P
	42 0.06					PFL3987S
	20 0.12	11 0.141	0.083	42 0.16	1200	PB03905P
7	12					PB03230M
	44 0.07					PFU3997M

NEEDED CT. FOUND FOR NEXT OTU #8

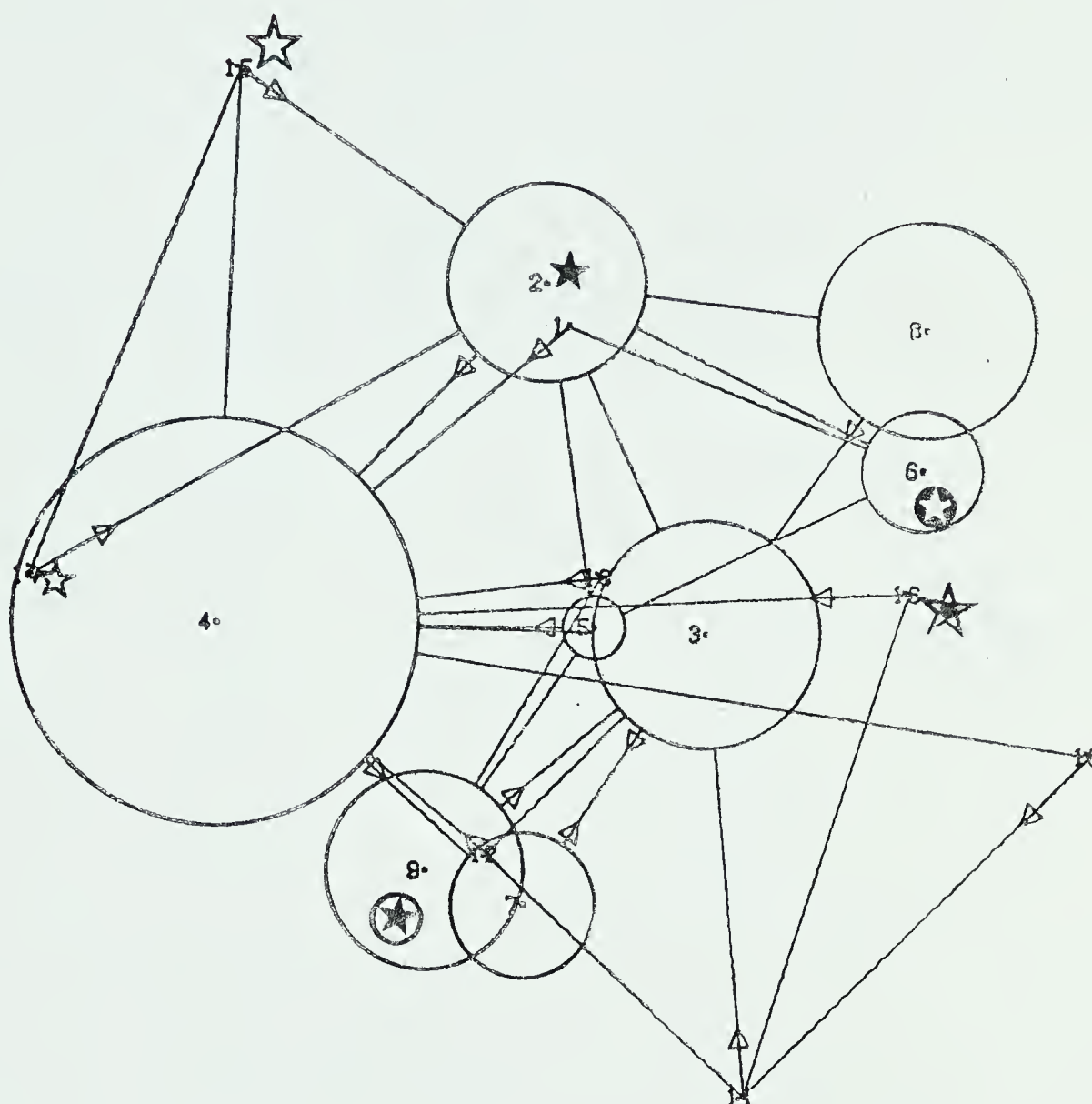
19	0.08	12	0.362	0.273	39	0.80	1008	PB03904P
37								PB0522DH
38	0.08							PB0522LO
36	0.09	37	0.097	0.017	38	0.10		PB0521FS
25	0.08	36	0.132	0.035	38	0.18	1006	PB0393ZS
18								PB03873M
20	0.09							PB0390SP
12	0.10	18	0.131	0.037	20	0.17	1006	PB0323OM

ISOLATED OTU'S (SINGLE MEMBER CLUSTERS)

CLUSTER	OTU	LABEL
10	9	PB023249
11	15	PB03749M
12	18	PB03750M
13	21	PB03981P
14	39	PAF40005
15	41	PDE39935
16	43	PF14257M

Fig. 13

Taxometric map for comparison of *Petriellidium* strains on conidial and vegetative attributes, differential weighting.



- ☆ *Petriellidium africanum*
- ★ *Petriellidium angustum*
- ★ *Petriellidium boydii*
- ☆ *Petriellidium desertorum*
- ⊙ *Petriellidium ellipsoideum*
- ★ *Petriellidium fimeti*
- ⊙ *Petriellidium fusoideum*

- ▲ *Kernia*
- ▲ *Lophotrichus*
- ▲ *Microascus*
- *Petriella*
- ◐ *Faurelina*
- *Pithoascus*
- ⬆ *Thielavia*

Table 8

2) Comparison of *Petriellidium* strains on conidial and vegetative attributes. b) Results of analysis with equal weighting.

MAP CLUSTER ANALYSIS:-PET SPECIES CONIDIAL CHARACTERS

(MINIMUM NUCLEUS 0.128, MAXIMUM DROP 0.0372 BOTH ARE 100% OF NORMAL)
EQUALLY WEIGHTED ATTRIBUTES

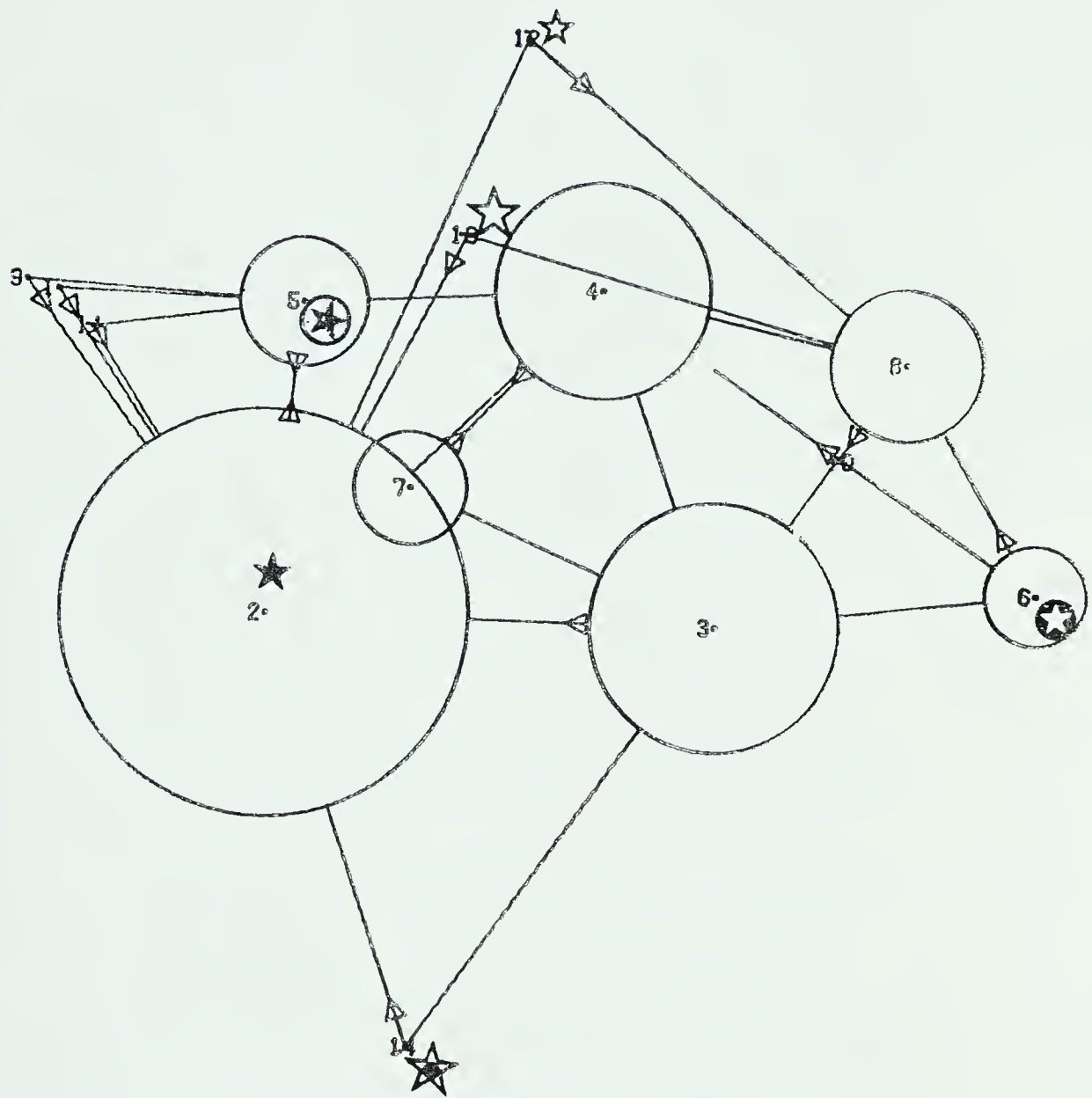
CLUS OTU DIST OTU AVCOF DROP FAR DIST FLAG NAME OF OTU
TER NOS BEST BEST NEW IN OTU FAR
NO. LINK LINK LINKS AVG. OTU

1	28								PB04238P
	28	0.0							PB04248P
	4	0.14	28	0.138	0.138	28	0.14	1200	PB01099P
2	26								PB03995S
	40	0.02							PAN3884K
	30	0.10	26	0.108	0.090	40	0.12		PB04301P
	24	0.08	30	0.112	0.003	40	0.14		PB03991S
	22	0.05	24	0.130	0.018	40	0.18		PB03982P
	35	0.09	24	0.155	0.025	40	0.22		PB03973P
	10	0.04	35	0.145-0.010		40	0.23		PB02507M
	13	0.04	10	0.157	0.002	40	0.27		PB03239M
	5	0.05	13	0.170	0.023	40	0.32		PB01101B
	4	0.08	35	0.148-0.023		40	0.24		PB01089P
	3	0.04	4	0.137-0.010		40	0.21	30	PB00800X
3	1								PB00002P
	6	0.03							PB01265P
	17	0.08	1	0.073	0.047	6	0.09		PB03872M
	7	0.03	17	0.055-0.018		6	0.07		PB01865M
	2	0.08	1	0.115	0.060	7	0.14		PB00153M
	18	0.05	2	0.137	0.021	7	0.18		PB03750M
	23	0.06	2	0.117-0.020		6	0.16		PB03990A
	13	0.09	2	0.165	0.048	7	0.23	1004	PB03239M
4	8								PB02217P
	32	0.03							PB04303P
	33	0.04	32	0.046	0.018	8	0.05		PB04304P
	27	0.05	8	0.078	0.032	33	0.10		PB04218P
	14	0.04	27	0.063-0.015		32	0.08		PB03746M
	34	0.04	14	0.059-0.004		33	0.08		PB04310P
	18	0.07	32	0.097	0.038	33	0.11		PB03873M
	36	0.09	14	0.132	0.035	18	0.17		PB0521F5
	37	0.09	36	0.184	0.052	32	0.23	1000	PB0522DH
5	3								PB00800X
	31	0.08							PB04302P
	19	0.07	3	0.081	0.018	31	0.09		PB03904P
	12	0.08	19	0.091	0.010	3	0.10		PB03230M
	44	0.07	12	0.084-0.007		3	0.10		PFU3997M
** NEEDED .GT. FOUND FOR NEXT OTU **									
	4	0.09	31	0.336	0.251	39	0.68	1004	PB01099P
6	11								PB02475P
	42	0.08							PEL3987S
	26	0.11	62	0.182	0.088	11	0.18	1000	PB03992S
7	37								PB05220M
	38	0.09							PB0522LD
** NEEDED .GT. FOUND FOR NEXT OTU **									
	36	0.10	38	0.387	0.299	43	0.68	1004	PB0521F5
8	15								PB03749M
	25	0.12							PB03992S
	17	0.12	25	0.150	0.032	15	0.18	8	PB03872M
	LINK TO CLUSTER -3								

ISOLATED OTU'S (SINGLE MEMBER CLUSTERS)

CLUSTER	OTU	LABEL
9	9	PB02324P
10	20	PB03905P
11	21	PB03981P
12	39	PAF4000S
13	41	PDE3993S
14	43	PF14257M

Fig. 14
Taxometric map for comparison of *Petriellidium* strains on conidial and vegetative attributes, equal weighting.



- ☆ *Petriellidium africanum*
- ★ *Petriellidium angustum*
- ★ *Petriellidium boydii*
- ☆ *Petriellidium desertorum*
- ⊗ *Petriellidium ellipsoideum*
- ☆ *Petriellidium fimeti*
- ⊗ *Petriellidium fusoides*

- ▲ *Kernia*
- ▲ *Lophotrichus*
- ▲ *Microascus*
- *Petriella*
- *Faurelina*
- *Pithoascus*
- ↑ *Thielavia*

Table 9

3) Comparison of all strains producing ascospores on ascospore and vegetative attributes. a) Results of analysis with differential weighting.

MAP CLUSTER ANALYSIS

(MINIMUM NUCLEUS 0.130, MAXIMUM DROP 0.0436 BOTH ARE 100% OF NORMAL)

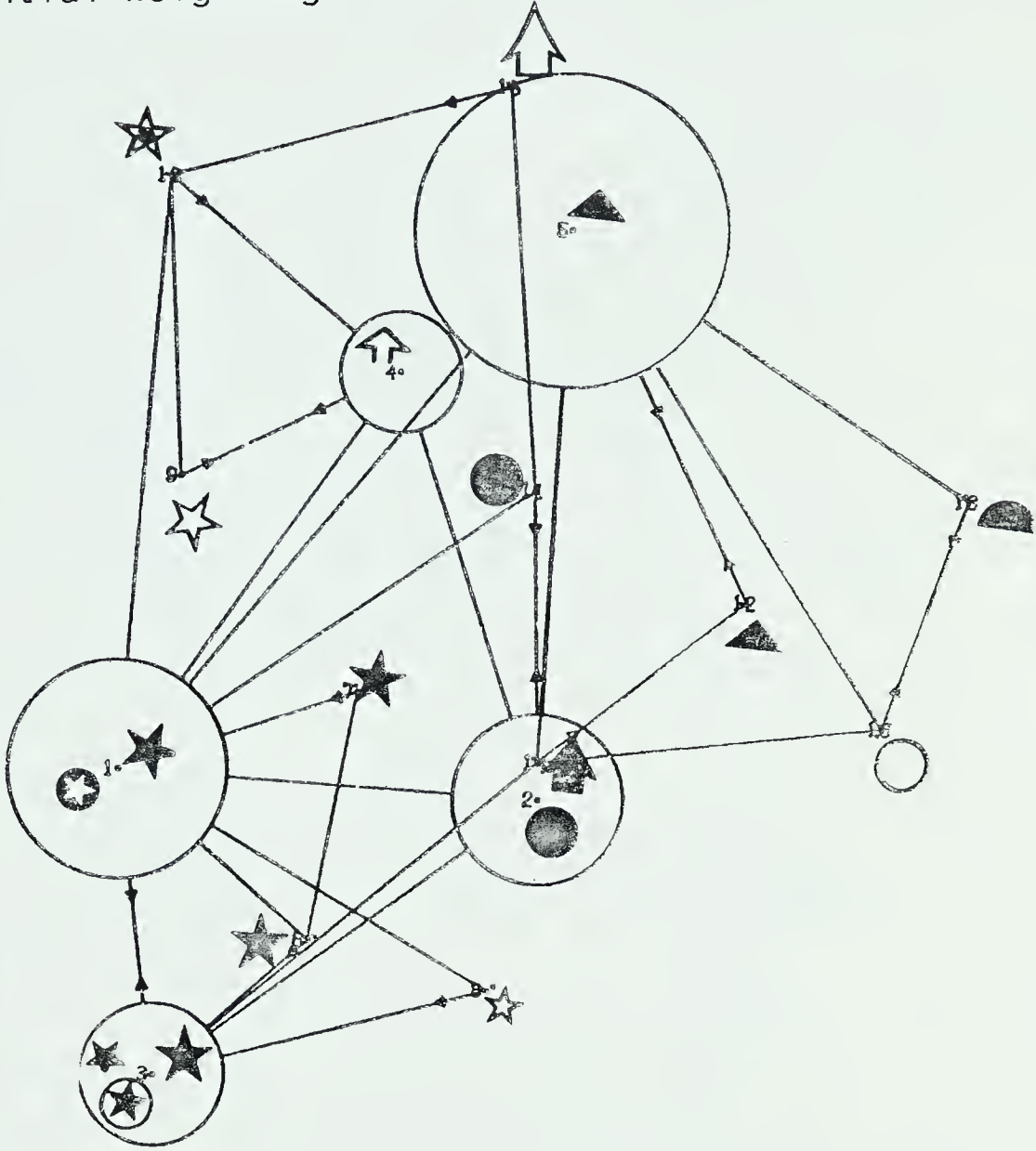
CLUS OTU DIST OTU AVGOF DROP FAR DIST FLAG NAME OF OTU
TER NOS BEST BEST NEW IN OTU FAR
NO. LINK LINK LINKS AVG. OTU

1	8								PB02217F
	12	0.02							PB04303P
	13	0.04	8	0.054	0.031	12	0.07		PB04304P
	4	0.05	5	0.055	0.011	13	0.08		PB01255P
	5	0.05	4	0.093	0.028	13	0.12		PB01865M
	8	0.04	8	0.075	0.018	13	0.11		PB03872M
	8	0.05	8	0.082	0.007	4	0.11		PB03873M
	1	0.05	8	0.086	0.004	8	0.12		PB00002F
	18	0.07	8	0.103	0.017	13	0.15		PB03887S
	11	0.07	12	0.100	0.003	18	0.13		PB04302P
	7	0.05	11	0.105	0.005	18	0.14		PB03238M
	2	0.05	7	0.095	0.010	18	0.12		PB00153N
	20	0.08	11	0.148	0.052	4	0.18	1000	PFU3997M
2	22								PSE1662C
	23	0.04							PSE1824S
	21	0.11	23	0.111	0.071	22	0.11		PL13995U
	24	0.15	21	0.159	0.042	23	0.18	1200	PSD1410U
3	10								PB03892S
	16	0.06							PAN3884K
	20	0.08	16	0.087	0.031	10	0.10		PFU3997M
	11	0.08	20	0.129	0.042	10	0.18	6	PB04302P
	LINK TO CLUSTER +1								
4	35								TBA4305S
	26	0.08							TTE1918S
	17	0.12	35	0.152	0.071	35	0.18	1000	PDE3983S
6	28								MMA2642M
	30	0.10							MTR0655U
	29	0.11	28	0.121	0.019	30	0.13		MS12637U
	25	0.13	28	0.145	0.024	29	0.17		MS36W10E
	26	0.14	25	0.182	0.018	28	0.21		MDE0966U
	27	0.17	29	0.225	0.083	25	0.25	1200	MIN2469P

ISOLATED OTU'S (SINGLE MEMBER CLUSTERS)

CLUSTER	OTU	LABEL
6	3	PB01101B
7	14	PB0521F3
8	15	PAF4000S
9	17	PDE3993S
10	19	PF14257M
11	24	PSD1410U
12	27	MIN2469P
13	31	FEL4232M
14	32	KBR3060U
15	33	LAM1782U
16	36	PLA4234C

Fig. 15
Taxometric map for comparison of all strains producing
ascospores on ascospore and vegetative attributes,
differential weighting.



- ☆ Petriellidium africanum
- ★ Petriellidium angustum
- ★ Petriellidium boydii
- ☆ Petriellidium desertorum
- ⊙ Petriellidium ellipsoideum
- ☆ Petriellidium fimeti
- ⊙ Petriellidium fusoideum

- ▲ Kernia
- ▲ Lophotrichus
- ▲ Microascus
- Petriella
- Faurelina
- Pithoascus
- ↑ Thielavia

Table 10

3) Comparison of all strains producing ascospores on ascospore and vegetative attributes. b) Results of analysis with equal weighting.

MAP CLUSTER ANALYSIS

(MINIMUM NUCLEUS 0.142, MAXIMUM DRDP 0.0451 BOTH ARE 100% OF NORMAL)
EQUALLY WEIGHTED ATTRIBUTES

CLUS TER NO.	OTU NOS	DIST BEST	OTU BEST	AVGOF NEW	DRDP IN	FAR OTU	DIST FAR	FLAG	NAME OF OTU
NO.	LINK	LINK	LINKS	AVG.	OTU	OTU	OTU		
1	6								FBO2217P
	12	0.02							FBO4303P
	13	0.03	6	0.041	0.022	12	0.05		FBO4304P
	8	0.06	12	0.074	0.033	13	0.08		PB03673M
	4	0.07	8	0.090	0.016	9	0.12		PB01265P
	8	0.05	4	0.086	0.003	13	0.11		PB03272M
	5	0.04	8	0.088	0.003	13	0.12		PB01865N
	1	0.05	4	0.090	0.001	9	0.13		PB00002P
	18	0.06	8	0.100	0.010	13	0.14		FEL3967S
	11	0.10	12	0.128	0.029	18	0.16		FBO4302P
	7	0.07	11	0.143	0.014	18	0.17		PB03238M
	20	0.07	11	0.154	0.021	4	0.21		PFU3997M
	2	0.08	7	0.121	0.043	20	0.18		PB00153N
	3	0.09	7	0.162	0.040	5	0.21		PB01101R
	18	0.10	20	0.138	0.028	13	0.26		PAH3984H
	10	0.08	18	0.149	0.040	13	0.20		PB01992S
	14	0.11	6	0.187	0.018	16	0.28		PB05217S
	23	0.23	1	0.332	0.185	3	0.42	1200	PSE1624S
2	22								PSE1662C
	23	0.04							PSE1824S
	24	0.15	22	0.162	0.124	23	0.17	1200	PS01610U
3	28								KMA2642M
	29	0.07							MS12637U
	30	0.10	28	0.108	0.043	29	0.12		MTR0656U
	28	0.12	29	0.143	0.034	28	0.17		MDE0966U
	25	0.12	28	0.148	0.005	30	0.17		MS36WIDE
	27	0.18	29	0.221	0.073	25	0.25	1200	MIN2468P
4	35								TBA4305S
	36	0.07							TTE1918S
	18	0.15	36	0.167	0.086	35	0.17	1200	PF14257M
5	21								PLI3989U
	24	0.14							PS01610U
	22	0.15	24	0.158	0.014	21	0.16	4	PSE1662C
	LINK TO CLUSTER -2								

ISOLATED OTU'S (SINGLE MEMBER CLUSTERS)

CLUSTER	OTU	LABEL
6	15	PAP4000S
7	17	PDE3993S
8	19	PF14257M
9	27	MIN2468P
10	31	FEL4232M
11	32	KBA3060U
12	33	LAM1762U
13	34	PLA4234C

Fig. 16

Taxometric map for comparison of all strains producing ascospores on ascospore and vegetative attributes, equal weighting.

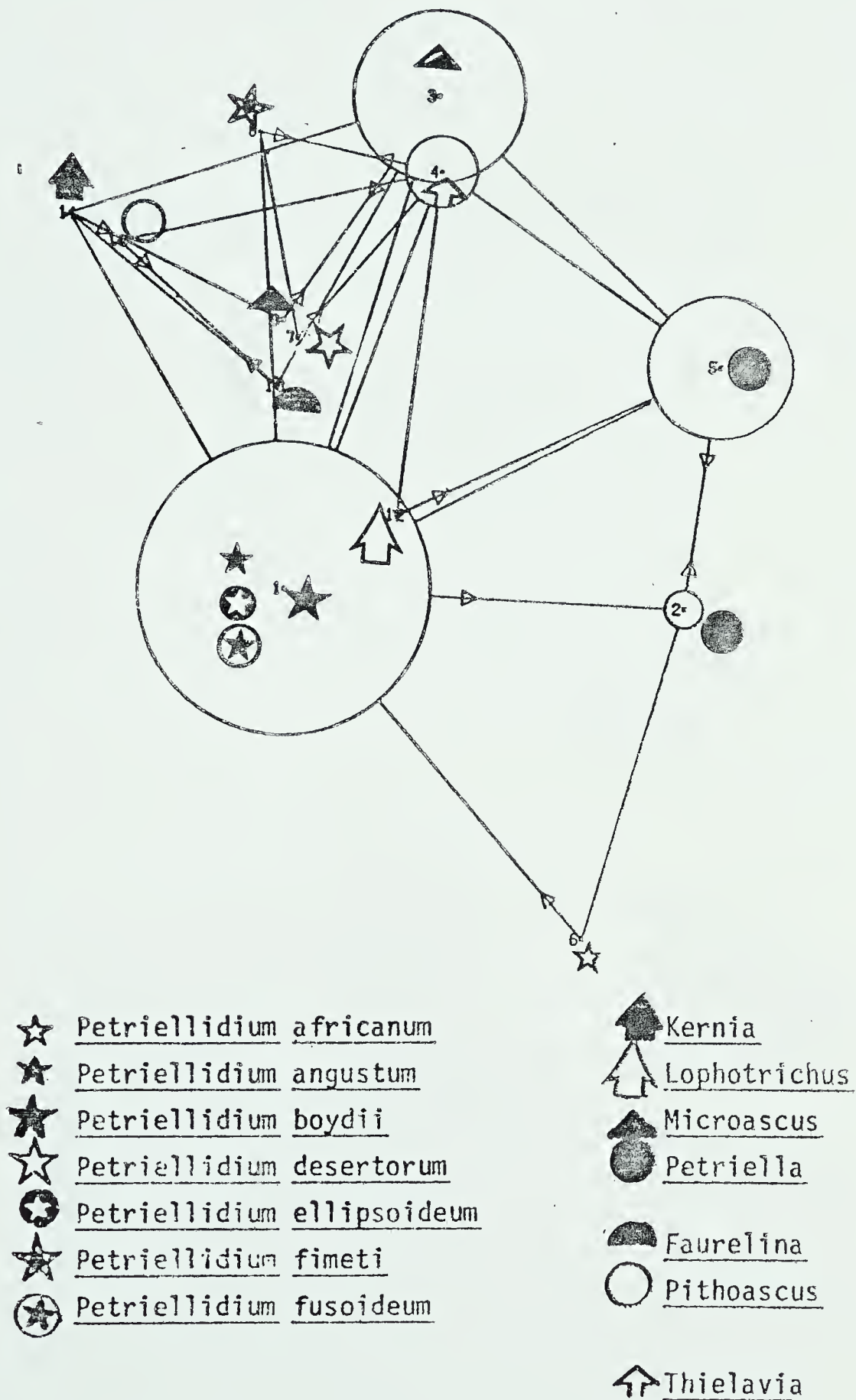


Table 11

4) Comparison of *Petriellidium* strains producing ascospores on ascospore and vegetative attributes. a) Results of analysis with differential weighting.

MAP CLUSTER ANALYSIS:-PET. SPECIES ASCO CHARACTERS APPLICABLE TO ALL
(MINIMUM NUCLEUS 0.112, MAXIMUM DROP 0.0660 BOTH ARE 100% OF NORMAL)

CLUS TER NO.	OTU NOS	DIST BEST LINK	OTU BEST LINK	AVG OF NEW LINKS	DROP IN AVG.	FAR OTU FAR	DIST OTU FAR	FLAG	NAME OF OTU
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1	6								PB02217P
	12	0.03							PB04303P
	4	0.08	5	0.069	0.042	12	0.08		PC01265P
	13	0.08	5	0.085	0.016	4	0.10		PB04304P
	1	0.07	4	0.103	0.018	12	0.12		PE00002P
	5	0.08	4	0.120	0.017	13	0.16		PBG1865N
	8	0.05	5	0.103-0.016		13	0.16		PB03872M
	9	0.06	8	0.115	0.012	1	0.16		PB03873M
	18	0.08	8	0.129	0.014	13	0.19		PEL3987S
	11	0.09	12	0.125-0.004		18	0.16		PB04302P
	7	0.08	11	0.131	0.005	18	0.17		PB03238M
	2	0.07	7	0.120-0.011		13	0.15		PB00153N

20	0.11	11	0.166	0.066	13	0.23	1000	PFU3997M
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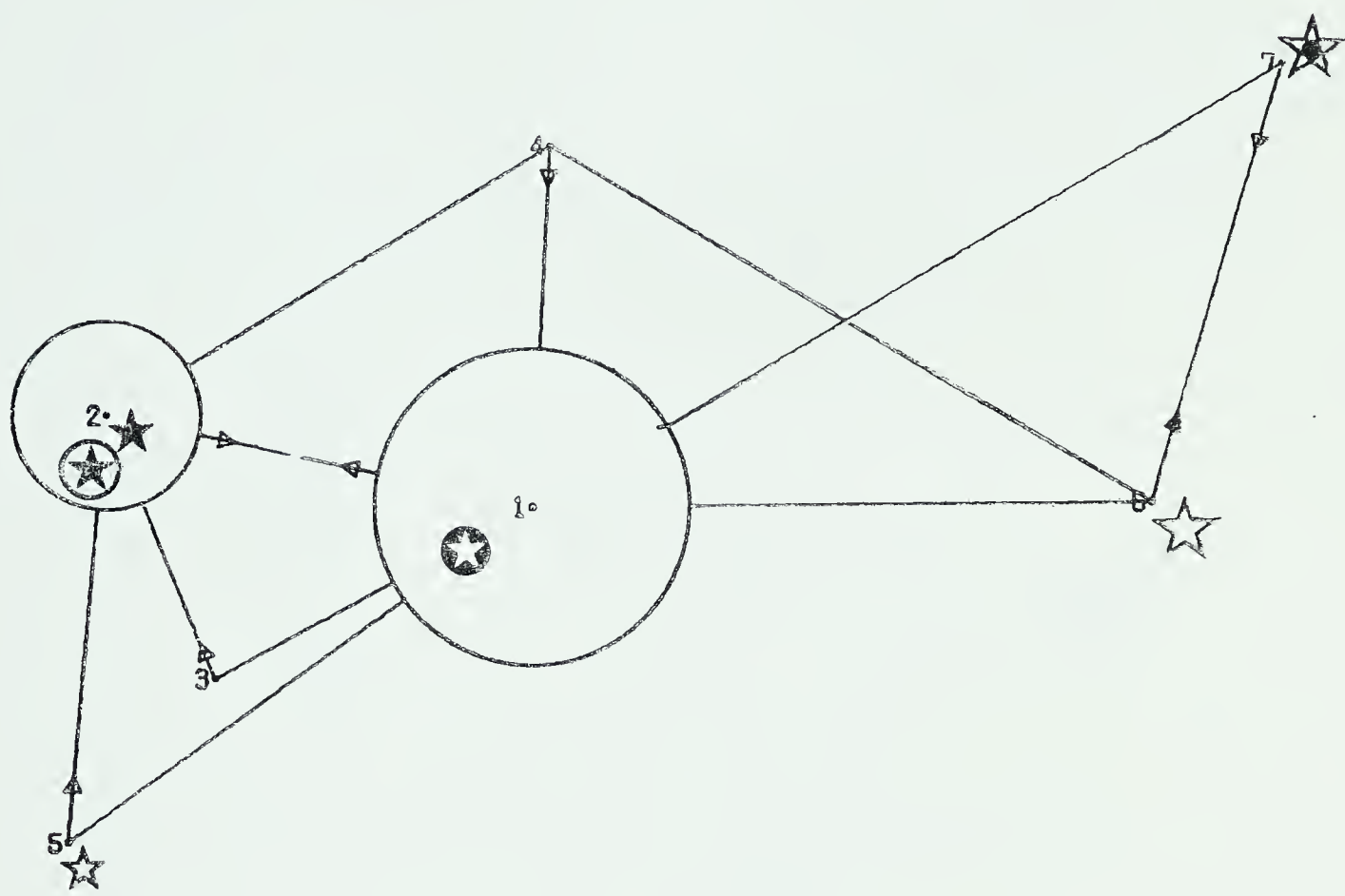
2	10							PB03992S
	16	0.07						PAN3984M
	20	0.08	16	0.103	0.036	10	0.11	PFU3997M

11	0.11	20	0.162	0.059	10	0.20	1004	PB04302P
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ISOLATED OTU'S (SINGLE MEMBER CLUSTERS)

CLUSTER	OTU	LABEL
3	3	PB01101B
4	14	PB0521FS
5	15	PAF4000S
6	17	PDE3993S
7	18	PF14257M

Fig. 17
Taxometric map for comparison of *Petriellidium* strains producing ascospores on ascospore and vegetative attributes, differential weighting.



- | | |
|-------------------------------------|-----------------------|
| ☆ <u>Petriellidium africanum</u> | ⬆ <u>Kernia</u> |
| ★ <u>Petriellidium angustum</u> | ⬆ <u>Lophotrichus</u> |
| ★ <u>Petriellidium boydii</u> | ⬆ <u>Microascus</u> |
| ☆ <u>Petriellidium desertorum</u> | ● <u>Petriella</u> |
| ⊗ <u>Petriellidium ellipsoideum</u> | ◐ <u>Faurelina</u> |
| ★ <u>Petriellidium fimeti</u> | ○ <u>Pithoascus</u> |
| ⊗ <u>Petriellidium fusoidium</u> | |
| | ⬆ <u>Thielavia</u> |

Table 12

4) Comparison of *Petriellidium* strains producing ascospores on ascospore and vegetative attributes. b) Results of analysis with equal weighting.

MAP CLUSTER ANALYSIS: PET. SPECIES ASCO CHARACTERS APPLICABLE TO ALL
(MINIMUM NUCLEUS 0.118, MAXIMUM DROP 0.0621 BOTH ARE 100% OF NORMAL)
EQUALLY WEIGHTED ATTRIBUTES

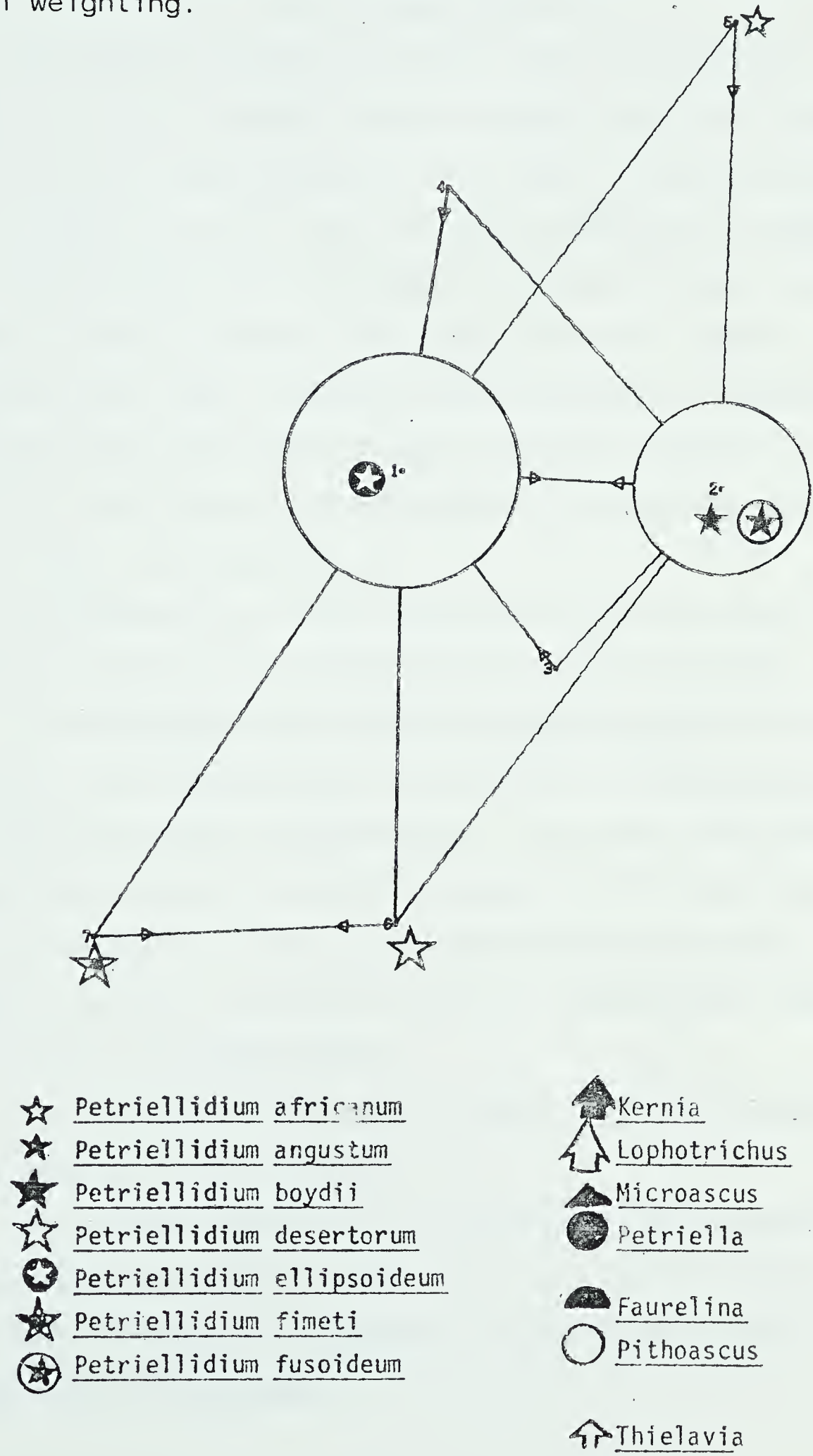
CLUS TER NO.	OTU NOS	DIST BEST LINK	OTU BEST LINK	AVCOF NEW LINKS	DROP IN AVG.	FAR OTU FAR	DIST OTU FAR	FLAG	NAME OF OTU
1	8								PB02217P
	12	0.02							PB04303P
	13	0.04	8	0.054	0.033	12	0.08		PB04304P
	4	0.07	6	0.085	0.031	13	0.10		PB01265P
	1	0.06	4	0.106	0.021	12	0.13		PB00002P
	8	0.08	4	0.118	0.013	13	0.15		PB03872M
	5	0.04	8	0.110	0.008	13	0.16		PB01865M
	18	0.07	8	0.121	0.011	13	0.17		PEL3987S
	8	0.08	8	0.117	0.004	1	0.18		PB03873M
	11	0.11	12	0.148	0.030	5	0.19		PB04302P
	7	0.08	11	0.162	0.014	3	0.19		PB03139M
	2	0.08	7	0.136	0.026	5	0.17		PB00153M
	20	0.08	11	0.193	0.056	4	0.24	1000	PFU3997M
2	10								PB03992S
	16	0.08							FAH3984M
	20	0.11	16	0.124	0.035	10	0.14		PFU3997M
	11	0.09	20	0.165	0.040	10	0.22	4	PB04302P
	LINK TO CLUSTER -1								

ISOLATED OTU'S (SINGLE MEMBER CLUSTERS)

CLUSTER	OTU	LABEL
3	3	PB01101B
4	14	PB0521FS
5	15	PAF4000S
6	17	PDE3993S
7	18	PF14257M

Fig. 18

Taxometric map for comparison of *Petriellidium* strains producing ascospores on ascospore and vegetative attributes, equal weighting.



b) Results of analysis with equal weighting.

Table 6 and Figure 12

The equally weighted analysis was similar to the differentially weighted analysis except that the *P. boydii* strains were separated more. The largest cluster contained 28 of the 38 strains, with three other species *P. angustum*, *P. ellipsoideum* and *P. fusoideum*. A second cluster contained eight *P. boydii* strains, the remaining two *P. boydii* strains UAMH 2324 and UAMH 3749 were isolated points, probably for the previously mentioned reasons. The rest of the *Petriellidium* species, *P. africanum*, *P. destorum* and *P. fimeti* were isolated points.

The *Petriella* strains were now contained within one cluster with only one isolated strain *Pe. musispora*.

The *Miscoascus* strains are grouped together in two clusters, one containing three species; *M. desmosporus*, *M. singularis* and *M. trigonosporus*, the other containing *M. longirostris* and *M. intermedius* plus the *Thielavia* and *Kernia* strains. Of the remaining *Microascus* species, *M. manginii* was an isolated point and *M. desmosporus* (wood) was clustered with *Lophotrichus*.

The *Pithoascaceae* strains *Faurelina* and *Pithoascus* were clustered as isolated points.

As in the differentially weighted analysis based on vegetative and conidial characters, the *Petriellidium* strains were nearest neighbours to each other except for *P. fimeti* and *P. africanum*.

2) Comparison of *Petriellidium* strains on conidial and vegetative analysis

a) Results of analysis with differential weighting.

Table 7 and Figure 13

All the strains were quite similar, none of the pairs being less than 67% similar (relative distance = 0.33).

The *P. boydii* strains were separated into six clusters of two or more strains (one cluster also included *P. angustum*). The main cluster contained 15 of the 38 strains. Three clusters contained at least one other species *P. angustum*, *P. ellipsoideum* or *P. fusoideum*. There were four isolated strains, UAMH 2324, 3749, 3750 and 3981. The remaining three *Petriellidium* species, *P. africanum*, *P. desertorum* and *P. fimeti* were isolated points.

The differentially weighted analysis based on vegetative and conidial attributes for the *Petriellidium* strains separated the *P. boydii* strains considerably. It is interesting to note that this analysis does not distinguish *P. angustum*, *P. ellipsoideum* or *P. fusoideum* from the *P. boydii* strains.

b) Results of the analysis with equal weighting

Table 8 and Figure 14

As in the differentially weighted analysis, all the strains were quite similar, none of the pairs being less than 67% similar.

The *P. boydii* strains were separated into seven clusters of two or more strains and three isolated points.

The main cluster contained 9 of the 38 strains with *P. ellipsoideum*. The two *Petriellidium* species, *P. angustum* and *P. fusoides* were contained in clusters with at least one *P. boydii* strain. The remaining *Petriellidium* species, *P. africanum*, *P. desertorum* and *P. fimeti* were isolated points.

3) Comparison of all strains producing ascospores on ascospore and vegetative attributes

a) Results of analysis with differential weighting

Table 9 and Figure 15

The *Petriellidium boydii* strains were clustered into two clusters. The largest cluster contained 11 of the 14 *P. boydii* strains and *P. ellipsoideum*; the other cluster contained one *P. boydii* strain plus *P. angustum* and *P. fusoides*. The remaining two *P. boydii* strains, UAMH 1101 and UAMH 4408 plus the remaining *Petriellidium* species, *P. africanum*, *P. desertorum* and *P. fimeti* were clustered as isolated points.

The *Petriella* strains were clustered as one cluster containing two species, *Pe. setifera* and *Pe. lindforsii* plus one isolated point *Pe. sordida*.

The *Microascus* strains were clustered as one cluster containing four species, *M. desmosporus*, *M. manginii*, *M. singularis* and *M. trigonosporus* and one isolated point *M. intermedius*.

The two *Thielavia* species were clustered together.

The remaining *Microascaceae*; *Kernia* and *Lophotrichus* along with *Pithoascaceae*; *Pithoascus* and *Faurelina* were clustered as isolated points.

It is noteworthy that in this analysis based on ascospore and vegetative attributes, the *Petriellidium* strains were nearest neighbours except *P. desertorum* and *P. fimeti*.

b) Results of analysis with equal weighting

Table 10 and Figure 16

The *P. boydii* strains were clustered as one cluster along with three *Petriellidium* species, *P. angustum*, *P. ellipsoideum* and *P. fusoideum*. The remaining *Petriellidium* species, *P. africanum*, *P. desertorum* and *P. fimeti* were clustered as isolated points.

The *Petriella* strains were grouped into two clusters; one cluster consisting of the *Pe. setifera* strains and the other included the remaining species *Pe. lindforsii* plus *Pe. sordida*.

The remaining genera were grouped as in the differentially weighted analysis.

As in the differentially weighted analysis based on ascospore and vegetative attributes, the *Petriellidium* strains were nearest neighbours except *P. desertorum* and *P. fimeti*.

4) Comparison of *Petriellidium* strains producing ascospores on ascospore and vegetative attributes

Table 11 and Figure 17

a) Results of analysis with differential weighting

The *P. boydii* strains were distributed among one main cluster, including 11 of the 14 strains plus *P. ellipsoideum*, a second cluster containing one *P. boydii* strain, (UAMH 3992), plus *P. angustum* and *P. fusoidium*, and two isolated points (UAMH 1101 and UAMH 4408). The nearest neighbour to UAMH 1101 is the *P. angustum* cluster. The remaining *Petriellidium* species, *P. africanum*, *P. desertorum* and *P. fimeti* were isolated points.

This differentially weighted analysis of *Petriellidium* ascospore producing strains based on ascospore and vegetative attributes could not differentiate *P. boydii* and *P. ellipsoideum* or *P. angustum* and *P. fusoidium*. It also included a *P. boydii* strain with the *P. angustum-fusoidium* cluster.

b) Results of analysis with equal weighting

Table 12 and Figure 18

The analysis was the same as the weighted analysis, except the isolated point UAMH 1101 is nearest neighbour with the *P. boydii* cluster.

IV. Taxonomic conclusions

A. Genera of the Microascaceae

Near the end of this study, Benny and Kimbrough (1980) proposed a revision of the orders and families of the Plectomycetes. Their key to the genera of the Microascaceae is reproduced in Table 13. The inclusion of *Arthrographis* under part A of the key appears to be an accidental substitution for *Sporothrix*. In all other respects, their key is supported by this study. The TAXMAP analyses generally grouped the species in conformity with the genera recognized in Benny and Kimbrough's key. Their separation of *Pithoascus* and *Faurelina* as a separate family, the *Pithoascaceae*, is also supported by the isolated position of these two genera in the analyses. In 1973, von Arx transferred *Microascus intermedius* to *Pithoascus*, but this reclassification is not supported by this study.

B. Species of *Petriellidium*

The results obtained in this study did not agree with Von Arx's classification scheme for *Petriellidium*. *P. ellipsoideum* was judged to be conspecific with *P. boydii*, and *P. fusoideum* conspecific with *P. angustum*. The TAXMAP analysis supported this conclusion. The remaining species, *P. africanum*, *P. desertorum* and *P. fimeti* were found to be good species.

Table 13 Benny and Kimbrough (1980) Classification of the Microascaceae.

- A. Ascocarps with a wall of *textura epiderm-
oidea*; ascospores with two germ pores;
anamorphs include *Graphium*, *Scedosporium*,
and *Arthrographis*.....B
- AA. Ascocarps with pseudoparenchymatous walls
composed of angular, dark cells.....C
- B(A). Ascocarps ostiolate; ascospores
reddish brown, often asymmetrical.....*Petriella*
Type species: *P. sordida* (Zukal)
Barron & Gilman, in Barron, Cain,
and Gilman, Can. J. Bot. 39: 839.
1961. Six species known (see
Barron et al., 1961a; Malloch,
1970a).
- BB(A). Ascocarps usually not ostiolate;
ascospores usually yellowish, rarely,
reddish, symmetrical.....*Petriellidium*
Type species: *P. boydii* (Shear) Malloch,
Mycologia 62: 738. 1970. Six species
known (see von Arx, 1973c).
- C(AA). Ascospores embedded in a hyphal "capill-
itium" at maturity, each with a prominent
germ pore.....*Enterocarpus*
Type species: *E. uniporus* Locquin-Linard,
Rev. Mycol. 41: 513. 1977. Two species.
- CC(AA). Ascospores small, not embedded in a
"capillitium," or with two germ pores.....D
- D(CC). Ascocarps ostiolate; ascospores
asymmetrical, with one germ
pore.....*Microascus*
Type species: *M. longirostris*
Zukal, Verh. Zool.-Bot. Ges.,
Wien 35: 339. 1885. Twelve
species known (see von Arx,
1975c for key to species;
additional species described
by Ram, 1971; Udagawa and Furuya,
1978; see also Barron et al.,
1961b; Morton and Smith, 1963).
- DD(CC). Not as above.....E
- E(CC). Ascocarps nonostiolate, with or without
tufts of hairs; ascospores with one or
two germ pores, hyaline, reddish, yel-
lowish, or brownish.....*Kernia*
Type species: *K. nitidia* (Sacc.) Nieuwland,
Amer. Midl. Nat. 4: 379. 1916. Five species
known (see Malloch and Cain, 1971c for key
to species). Syn.: *Magnusia* Sacc. non
Magnusia Klotzsch (see Benjamin, 1956b).
- EE(CC). Ascocarps usually ostiolate, with an
apical tuft of thick-walled hairs;
ascospores with two germ pores,
yellowish or brownish.....*Lophotricus*
Type genus: *L. ampullus* Benjamin,
Mycologia 41: 347. 1949. Five species
known (see Seth, 1971 for key to
species; additional species described
by Morinaga et al., 1978).

P. angustum was found to be quite similar to *P. boydii*, but differed by smaller, narrower ascospores. The *Scedosporium* states of these two species are indistinguishable. The TAXMAP analysis supported these observations. An important question is raised: is *P. angustum* pathogenic? Since its *Scedosporium* anamorph cannot be distinguished from *P. boydii*, this question needs to be answered by pathogenicity studies (Lupan and Cazin 1973, Bell 1978). The four strains of *P. angustum* studied here were all from saprophytic sources.

Strains UAMH 1101 and UAMH 3992 were found to be misidentified as *P. boydii* and were transferred to *P. angustum*. The remaining strains previously identified as *P. boydii* were found to be correctly identified.

P. fimeti UAMH 4257 did not produce a conidial state. It is not known whether the conidial states von Arx (1978) described for this species have been lost through subculturing or whether they represented a contaminant. *P. fimeti* was mixed with *Pithoascus langeronii* when received from CBS.

Key to the species of *Petriellidium*

Two keys to the genus *Petriellidium* are being presented; the first based on ascospore size, the second on conidium size. The key based on the *Scedosporium* anamorph is necessary because *Petriellidium* species do not always produce the ascogenous state, or if produced the ascospores may be immature and accurate measurements may unobtainable.

P. africanum is not included in the first key because it did not produce ascospores in this study. The presence or absence of the *Graphium* conidial state is not used in the keys due to its irregular and unpredictable occurrence.

Key to the species of *Petriellidium* based on ascospore size

- (1)Ascospores larger than 9 μm x 6 μm*P. desertorum* & *P. fimeti*
- (1)Ascospores smaller.....2
 - (2)Ascospores 6-8.5 x 3.5-5.5 μm*P.boydii*
 - (2)Ascospores 5-6.5 x 2-4 μm*P. angustum*

Key to the species of *Petriellidium* based on conidium size

- (1)*Scedosporium* conidia present.....2
- (1)*Scedosporium* conidia not present.....*P. fimeti*
 - (2)*Scedosporium* conidia 5-10.5 x 2.5-6 μm ..*P. boydii* or *P. angustum*
 - (2)*Scedosporium* conidia smaller3
 - (3)conidia 3.5-6 x 1-2.5 μm no large chlamydospores.
P. africanum
 - (3)conidia 4-8 x 1.5-4 μm large chlamydospores present.....

P. desertorum

P. desertorum and *P. fimeti* cannot be distinguished on ascospore sizes, however the *Scedosporium* conidia are not

seen in *P. fimeti*, *P. boydii* and *P. angustum* cannot be distinguished on their *Scedosporium* conidia but their ascospore sizes differ.

C. Nomenclator of *P. boydii*

Negrone and Fischer's type of *Pseudallescheria shearii* UAMH 3973 was examined in this study and found to be a typical *P. boydii* anamorph. Although they misidentified their fungus, they did create a legitimate generic name for *Allescheria boydii*. However, previous investigators have not accepted or used *Pseudallescheria*. When Malloch (1970) reclassified *Allescheria boydii* to *Petriellidium boydii*, he missed Negrone and Fischer's genus *Pseudallescheria*, which should have been retained. In my opinion the name *Petriellidium* should now be conserved for two reasons; 1) Negrone and Fischer's type strain no longer produces the ascogenous state and therefore some doubt remains about its identification, and 2) researchers and medical mycologists have accepted the name *Petriellidium* as a replacement for *Allescheria*. Changing the name would only result in needless confusion. It would also enshrine a name based originally on a misidentification.

D. Composite description of *P. boydii* and *P. angustum*

P. boydii (Shear) Malloch 1970

Colonies on Oatmeal at first whitish becoming mouse brown or grey, reverse light to dark, colony texture matted

fur. Mycelium hyaline, irregularly branched. Ascomata present or absent, spherical, non-ostiolate, usually submerged, brown-black in colour, translucent, wall of *textura epidermoidae*, 55.5-182 μm in diameter. Asci spherical to ovoid, evanescent, eight-spored. Ascospores ellipsoidal, symmetrical, golden, with two polar germ pores, 6-8.5 x 3.5-5.5 μm . Conidia of two types. Diffuse conidia (*Scedosporium*) state, normally present, clavate to ovoid, hyaline at first, then dilute yellow brown, borne singly or successively, directly from the sides of the hyphae or from the tip of annellidic conidiogenous cells, accumulating in small easily dispersed masses, 5-10.5 x 2.5-6.5 μm . Synnematus conidia (*Graphium*) frequently absent, clavate to cylindrical, hyaline at first, then to dilute yellow brown, produced successively from annellate conidiogenous cells, accumulating in a slime ball at the tip of the synnema, 3-11.5 (22.5) x 1.5-3.5 (6.5) μm .

This description was based on a combination of the characters of all *P. boydii* strains studied.

P. angustum Malloch and Cain 1972

Colonies on Oatmeal at first whitish, becoming light to dark mouse brown, reverse light to dark, colony texture matted fur. Mycelium hyaline, irregularly branched. Ascomata spherical, non-ostiolate, submerged, brown-black, transparent to translucent, wall of *textura epidermoidae*, 40-143 μm in diameter. Asci spherical to ovoid, evanescent,

eight-spored. Ascospores ellipsoidal, symmetrical, golden with two polar germ pores, 5-7 x 2-4 μ m. Conidia of two types identical to those described above for *P. boydii*.

This description is based on the four *P. angustum* strains examined.

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